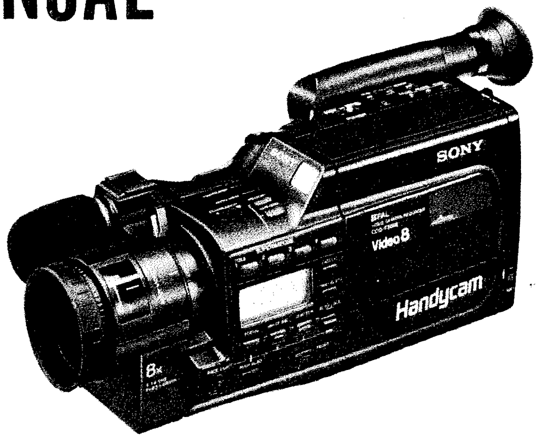
CCD-F500E

SERVICE MANUAL

AEP Model
UK Model
Australian Model
E Model



Handycam
Video 8

O' MECHANISM

SPECIFICATIONS

This manual contains SUPPLEMENT-1.

System

Video recording system	Rotary two heads, Helical scanning FM system
Audio recording system	Rotary head, FM system
Video signal	PAL colour, CCIR standards
Usable cassette	8 mm video format cassette
Tape speed	SP: Approx. 20.051 mm/sec. LP: Approx. 10.058 mm/sec.
Recording time	SP mode: 1 hour 30 min LP mode: 3 hours (P5-90)
Playback time	SP mode: 1 hour 30 min LP mode: 3 hours (P5-90)
Fast forward time	Approx. 6 min. 30 sec. (P5-90)
Image device	CCD (Charge Coupled Device)
Viewfinder	Electronic viewfinder (black and white)
Lens	Combined 8 × power zoom lens f = 8.5 – 68 mm, F1.4 with macro Filter diameter: 46 mm
Auto focus system	Infrared autofocus
Colour temperature	Auto: From the light at a tungsten lamp to the light on a slightly overcast day. Preset value ☀ (5800K) 💡 (3200K)
Minimum illumination	3 lux
Illumination range	3 lux – 100,000 lux (0.3 – 9,294 footcandles)
Recommended illumination	More than 300 lux (28 footcandles)
Aperture correction	Automatic

Input and output connector

Video output	Phono jack, 1 Vp-p, 75 ohms unbalanced sync negative
Audio output	Phono jack, –7.5dBs, at output impedance less than 2.2 kilohms
RFU DC OUT	Special minijack, 5V DC
Earphone jack	Minijack, 8-ohm impedance
Remote jack	Stereo mini-minijack
MIC jack	Minijack, – 66 dBs, low impedance With 2.5 – 3 V DC output, impedance 6.8 kilohms
Microphone power output jack	Special minijack, 5 V DC

Display in the viewfinder

Mode and caution indicators
Mode: REC/STBY, ■, ☀/💡, ▨, ZERO MEM, FADER, SP/LP
Caution: 🔋, 💧, 📼, ⏏, ⊗
Time/date indication
Title color and mode indication
Shutter speed indication
Tape counter
Recording/battery lamp

— continued on next page —

8 VIDEO CAMERA RECORDER

SONY®

MICROFILM

General

Power requirements	6.0V (using battery pack)/ 7.5V (using AC power adaptor)/9.0V (using alkaline batteries) DC
Power consumption	6.5 W (camera recording) including the viewfinder
Installation	Vertically
Operating temperature	0°C to 40°C (32°F to 104°F)
Storage temperature	–20°C to +60°C (–4°F to +140°F)
Dimensions	Approx. 114 × 131 × 315 mm (w/h/d) ($4^{1}/_{2} \times 5^{1}/_{4} \times 12^{1}/_{2}$ in.)
Weight	Approx. 1.2 kg (2 lb 10 oz) excluding the battery and cassette
Microphone	Electret condenser microphone, uni-directional monaural type

Optional accessories

Battery pack NP-55, NP-77
AC power adaptor AC-V55
Battery case EBP-55
DC pack DCP-55
Connecting cable
  VMC-910MSP/920MSP (2 phono to 3 phono),
  VMC-710MP/720MP (2 phono to 2 phono),
  VMC-262M (2 phono to 6-pin),
  VMC-2104M (4 phono to 21-pin)

Design and specifications are subject to change without notice.

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer:

1. Check the area of your repair for unsoldered or poorly-soldered connections. Check the entire board surface for solder splashes and bridges.
2. Check the interboard wiring to ensure that no wires are "pinched" or contact high-wattage resistors.
3. Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement.
4. Look for parts which, though functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replacement.
5. Check the B+ voltage to see it is at the values specified.

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK ⚠ OR DOTTED LINE WITH MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

TABLE OF CONTENTS

Section *Title* *Page*

1. GENERAL
1-1. Warning 5
1-2. Identifying the Basic Parts 5
1-3. Power Sources 8
1-4. Cassette Care 11
1-5. Adjustment of the Position of the Viewfinder Lens 12
1-6. Easy Camera Recording with Automatic Adjustment 12
1-7. Insert Recording 15
1-8. Manual Focusing 16
1-9. White Balance Function 17
1-10. Back Light Adjustment [J] 18
1-11. Shutter Speed Adjustment 19
1-12. Zooming 20
1-13. Close-ups (Macro) 20
1-14. Fade-in and Fade-out Function 21
1-15. Recording Date or Time 22
1-16. Recording a Title 23
1-17. Use of the BUILT-IN MIC Switch 27
1-18. Preparation for Playback 27
1-19. Playback 30
1-20. Use of the Tape Counter 31
1-21. Tape Editing 32
1-22. Hints for Better Shooting 32
1-23. Use of the Battery Pack 35
1-24. Notes on Moisture Condensation 36
1-25. Precautions 36
1-26. Using Your Recorder Abroad 37

2. DISASSEMBLY
2-1. Removal of Viewfinder 38
2-2. Removal of Cabinet (1) 38
2-3. Removal of Cabinet (2) 38
2-4. Removal of Cabinet (3) 38
2-5. Separating the Camera and VTR Blocks 39
2-6. Removal of VC-61P (CCD IMAGER), VC-62P and VC-63P Boards 39
2-7. Removal of LS LID 40
2-8. Opening the VA-43 Board 40
2-9. Opening the SS-93P Board 40
2-10. Removal of Cassette Arm 41
2-12. Removal of LS Cassette Compartment Assembly 41

Section *Title* *Page*

3. DIAGRAMS
3-1. Circuit Boards Location 42
3-2. Overall Block Diagram 43
3-3. Camera Block Diagram 48
3-4. Auto Focus Block Diagram 53
3-5. Digital Titler Block Diagram 55
3-6. Video Block Diagram 57
3-7. Servo/System Control Block Diagram 61
3-8. Mechanism Controller (μPD78112-GF) 65
3-9. System Control-Camera Block Interface 68
3-10. System Control-Video, Audio Block Interface 69
3-11. System Control-Servo Peripheral Circuit Interface 69
  3-11-1. Timing Chart 1 (PB, EDIT CUE) 71
  3-11-2. Timing Chart 2 (EDIT REVIEW) 71
  3-11-3. Timing Chart 3 (CUE) 71
  3-11-4. Timing Chart 4 (REVIEW) 71
  3-11-5. Timing Chart 5 (REC) 71
3-12. System Control-Peripheral Circuit Interface 72
3-13. Audio Block Diagram 74
3-14. Power Supply Block Diagram 77
3-15. Viewfinder Block Diagram 81

4. PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS
4-1. Frame Schematic Diagram 83
4-2. Printed Wiring Boards and Schematic Diagrams 87
  • VC-61P (CCD Imager), VC-62P, VC-63P and DC-21P Boards 87
  • VC-61P (Auto White Balance), AF (Auto Focus) Boards 96
  • SS-93P Board (Digital Titler) 103
  • SS-93P (REC/PB Amp), VA-43 and MC-36P Boards 110
  • SS-93P (Servo/System Control), SW-111P, ZM-10P, PA-24P, CC-7 and FP-53 Boards 120
  • FC-25P, FV-4P, FD-12P and EJ-9P Boards 130
  • VF-13P, TL-18P, and TL-19P Boards 137
  • DT-73 Board 142
  • MX-7 Board 145
  • PR-20 Board 146
4-3. Semiconductors 148

Section Title Page

5. EXPLODED VIEWS

5-1. Right Cabinet Assembly 152
5-2. Left Cabinet Assembly 153
5-3. Cassette Arm and Frame Assembly 154
5-4. LS Cassette Compartment Assembly 155
5-5. Chassis Assembly (1) 156
5-6. Chassis Assembly (2) 157
5-7. Camera Block Assembly 158

Section Title Page

6. **ELECTRICAL PARTS LIST** 159
HARDWARD LIST 179

SUPPLEMENT-1

SECTION 1
GENERAL

This section is extracted from instraction manual.

1-1. WARNING

To prevent fire or shock hazard, do not expose the unit to rain or moisture.

Dangerously high voltages are present inside the unit. Do not open the cabinet. Refer servicing to qualified personnel only.

Please refer to the illustration corresponding to the letter code indicated in the instructions.

The CCD-F500E is a compact video camera recorder combined with a tape recorder. You can record pictures you want and play them back on your television set or colour monitor.

Make sure your supplements
The following units are packed with the CCD-F500E video camera recorder.
- Battery pack NP-55 (1)
- Lithium battery (1)
- AC power adaptor AC-V30 (1)
- Cassette (1)
- RFU adaptor RFU-89EA/ASA (1)
- Aerial selector (1)
- Screw driver (1)
- Shoulder strap (1)

For details on these units, please read their instruction manuals.

How to Use This Manual

How the manual is Organized
This manual consists of following four sections:
- Power Sources and Cassette Care
- Camera Operation
- VTR Operation
- General (Hints for Better Shooting, Specification, Troubleshooting etc.)

If it is the first time for you to use a video camera recorder, you should read Power Sources (page 9), Easy Camera Recording with Automatic Adjustment (page 17) and Playback (page 52).

If you are used to a video camera recorder, you should read Hints for Better Shooting at the end of the volume.

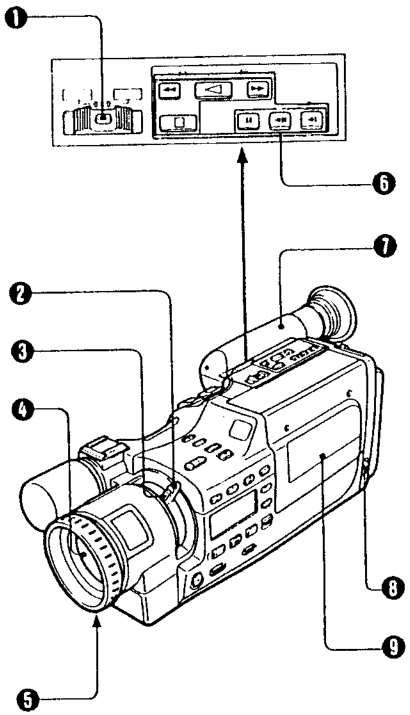
Notes
- Television programmes, films, video tapes and other materials may be copyrighted. Unauthorized recording of such material may be contrary to the provisions of the copyright laws.
- PCM recording/playback is not possible with this unit. The PCM sound recorded or after-recorded with another recorder cannot be played back with this unit.

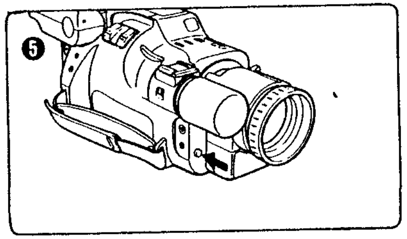
About Cassette Format

This unit uses 8 mm video format cassettes. It records in the SP mode (approximately 20.051 mm/second) and the LP mode (approximately 10.058 mm/second) and can play back in the SP mode and LP mode. The quality of the playback picture in the

1-2. IDENTIFYING THE BASIC PARTS

A-1





For details on the use of each control, refer to the pages indicated in the parenthesis.

A-1

❶ **POWER switch**
CAMERA: For camera recording
PLAYER: For playing back or editing tapes
OFF: Power off

❷ **Zoom lever** (page 32)

❸ **Macro set button** (page 34)

❹ **Focus ring** (page 24)

❺ **START/STOP button**
Used for low position recording.

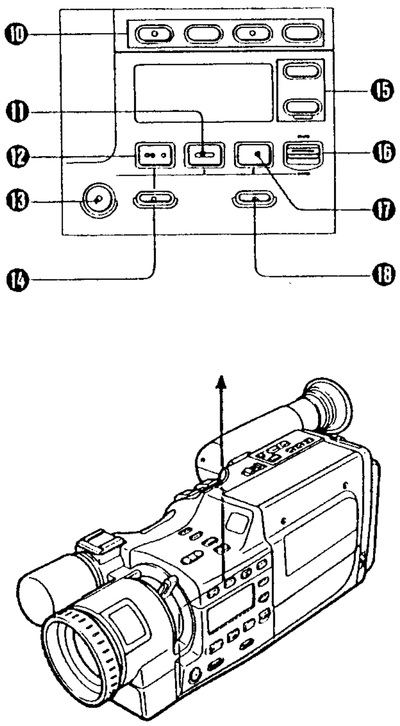
❻ **Tape transport buttons**
◁ (playback)
◀◀ FF (fast forward)
▶▶ REW (rewind)
□ (stop)
❚❚ (pause)
◀❚❚ (frame-by-frame)
◀❘ (slow)

❼ **Viewfinder**
The picture being recorded or played back can be monitored in monochrome here. Also, data such as caution indicators and function mode are displayed on the viewfinder screen.

❽ **BATT (battery eject) knob** (page 11)

❾ **Cassette holder**

A-2



A-2

⑩ **SUPERIMPOSE buttons** (page 39)
Used to record the title.

TITLE 1 button	TITLE 3 button
TITLE 2 button	TITLE 4 button

⑪ **WHITE BAL** (white balance) **button** (page 28)

⑫ **FOCUS button**
Used for manual focusing.

⑬ **BACK LIGHT button** (page 29)

⑭ **PUSH AUTO button** (page 26)

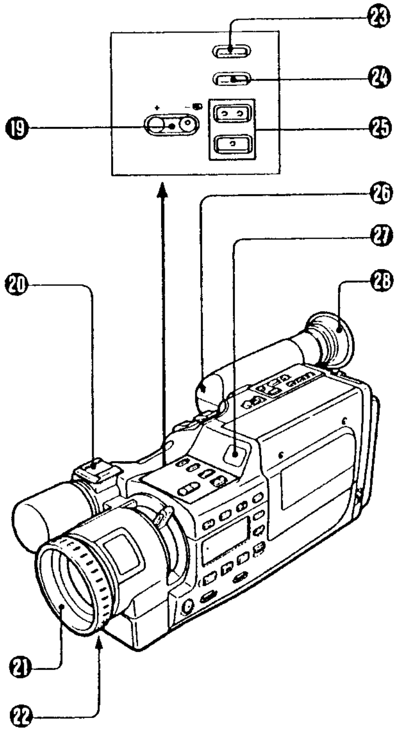
⑮ **DATE and TIME buttons**
Press to display or turn off the date or time.

⑯ **AUTO LOCK switch**
Normally set to the upper AUTO LOCK position (green position).

⑰ **SHUTTER SPEED button** (page 30)
Used to select the shutter speed.

⑱ **FADER button** (page 35)

A-3



A-3

⑲ **EDITSEARCH button**

⑳ **Accessory shoe**
Attach an optional external microphone, video light, etc.

㉑ **Lens hood**

㉒ **Infrared beam emitter and detector**
Transmits an infrared beam toward the object to be shot and it is received here during auto focusing. Do not look into for a long time when recording with auto focusing. Do not cover here.

㉓ **COUNTER RESET button**
Press to reset the counter to zero.

㉔ **ZERO MEM (zero memory) button**
Used to memorize the counter zero point.

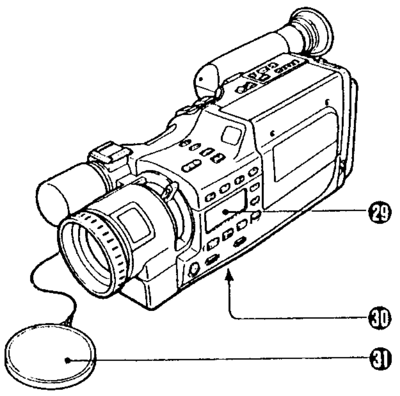
㉕ **MEMORY button**
COLOR/MODE button
Used to record the title.

㉖ **Camera recording/battery lamp**
Lights during camera recording. It blinks when the battery is exhausted.

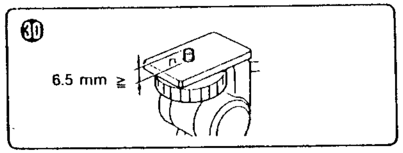
㉗ **White balance sensor**
This is the sensor for auto white balance adjustment.
During recording, do not cover the sensor.

㉘ **Eyecup**

A-4



A-5



A-4

㉙ **Display window** (page 20)

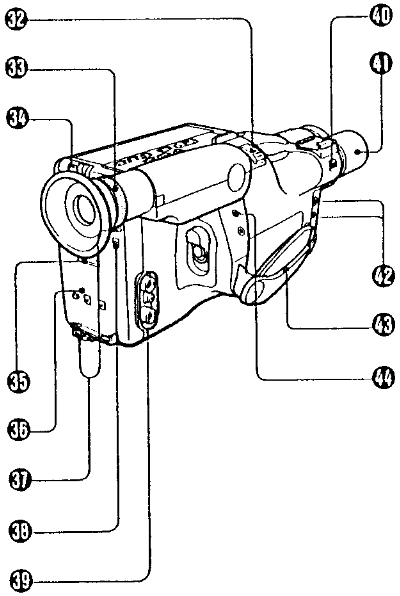
A-5

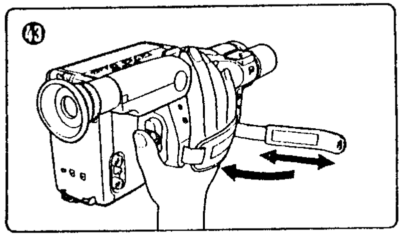
㉚ **Tripod receptacle**

Note when attaching a tripod not manufactured by Sony
When attaching a tripod not manufactured by Sony, the length of the camera mounting screw must be less than 6.5 mm.
Otherwise the screw may damage the inner parts of the camera.

㉛ **Lens Cap**

A-6





A-6

㉜ **Power zoom button** (page 32)

㉝ **Viewfinder lens adjustment ring** (page 16)
Adjust to your eyesight to assure good focus. Be sure to adjust this ring when shooting for the first time.

㉞ **EJECT (cassette eject) button** (page 15)

㉟ **Lithium battery compartment** (page 14)

㊱ **Battery mounting surface**

㊲ **Hooks for shoulder strap**
Attach a shoulder strap.

㊳ **REC MODE (recording mode)/EDIT switch**
Switch it depending on the operating mode.

Mode	Recording	Playback	Editing
Setting	SP LP	EDIT	EDIT
Function	REC MODE switch	EDIT switch	

㊴ **VIDEO/AUDIO OUT (output) jacks (phono jacks)**
RFU DC OUT (RFU adaptor DC output) jack (special minijack)
Supplies power to the RFU-89EA/ASA RFU adaptor.

㊵ **BUILT-IN MIC switch** (page 46)
Usually set to upper position (green position).

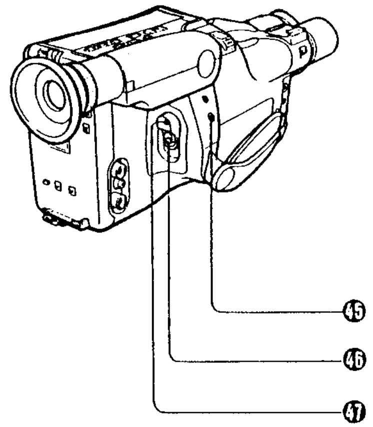
㊶ **Built-in microphone (monaural)**

㊷ **MIC jack and DC OUT (microphone power output) jack**
Connect an external microphone.
The MIC jack accepts Sony "plug-in-power" microphones and supplies power to them.

㊸ **Grip strap**
Adjust the length so that your thumb can easily manipulate the START/STOP button.

㊹ **REMOTE connector (stereo mini-minijack)**

A-7



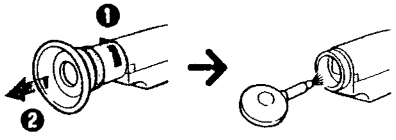
A-7

㊺ 🎧 (earphone) jack (minijack)

㊻ **START/STOP button**
Press to start and stop camera recording.

㊼ **STANDBY switch**
Slide up to set the unit to recording pause mode.

A-8



To remove dust from inside the viewfinder A-8
Detach the eyecup as illustrated and clean the surface of the screen with a blower.

1-3. POWER SOURCES

Selection of Power Sources

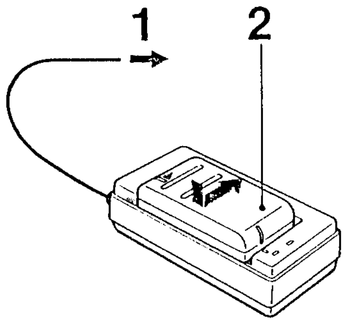
This manual shows the operations on one of the following power sources.

Place		Power source	Accessory to be used
Place	Indoors	House current	AC power adaptor AC-V30 (supplied) or AC-V55 (page 13)
	Outdoors	Battery pack	Battery pack NP-55 or NP-77 (page 10) Battery case EBP-55 (page 12)
	In the car	12 V or 24 V car battery	DC pack DCP-55 (page 13) (DCC-16B car battery cord supplied)

Notes on power source
- Disconnecting the power source or removing the battery pack during recording or playback may damage the inserted cassette tape. If this is done by accident, supply the power again immediately and turn on the power switch.
- Be careful not to let any metal object touched on the metal part on the battery pack or AC power adaptor. When the battery pack is not being used, keep it in its case.

Optional Accessories for Charging
- **AC-V55 AC power adaptor**
  Two battery packs can be charged simultaneously.
- **BCA-70 or BCA-80 battery charge adaptor, ACP-88 AC pack and NPA-55 battery adaptor**
  For charging, insert an NP-55 into the NPA-55.

B-1

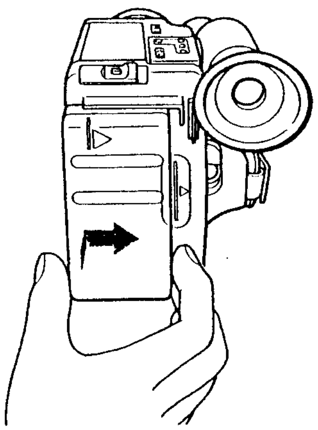


Battery Pack — NP-55 or NP-77

First, charge the battery pack B-1
Use the supplied AC-V30 AC power adaptor.
The charging time is about 1 hour for an NP-55 battery pack, or about 2 hours for an NP-77 battery pack.

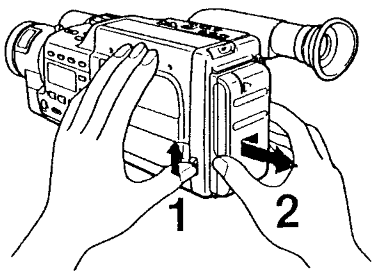
1. **Connect the AC-V30 to a wall outlet.**
2. **Attach the battery pack to the AC-V30.**
   Align the grooves on the battery pack with those on the AC-V30, and while pressing the battery pack slide it as illustrated.

B-2



To attach the battery pack to the video camera recorder B-2
Align the right side of battery pack with the line on the recorder, and while pressing the battery pack, slide it to the right.
Make sure that the battery is fitted completely to the mounting surface. Imperfect fit may damage the projections on the recorder.

B-3



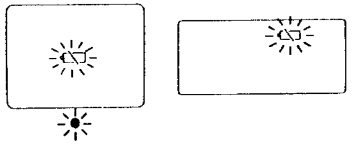
To remove the battery pack B-3
While pressing the BATT knob in the arrow direction, slide to the left and pull out the battery pack as illustrated.

Battery life
A fully-charged NP-55 battery pack provides approximately 40 minutes of continuous camera recording, and an NP-77 provides approximately 80 minutes of continuous camera recording.

Notes
- The video camera recorder consumes power even in the recording pause mode. When recording short scenes using the recording pause mode, the battery life is less than half that of continuous recording.
  When recording is not to be started soon, turn off the power with the STANDBY switch.
- If the battery pack is not fully charged or if it is used in a cold place, or if the metal parts on the battery pack and the camera are dirty, its operating time is also shortened.

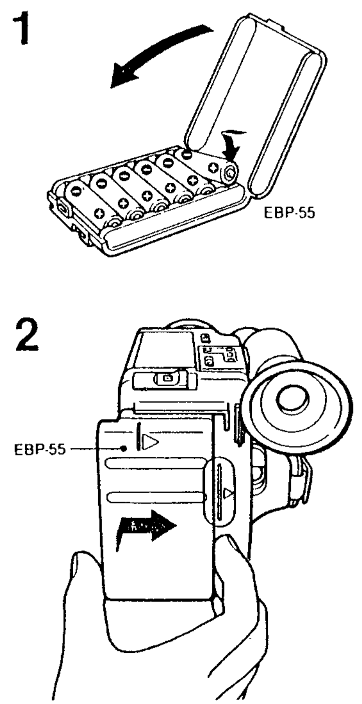
When the video camera recorder is not in use, remove the battery pack.
If the battery is installed, even if the POWER switch is set to OFF, a very small amount of electric current flows.

B-4



When the battery becomes weak B-4
The 🪫 indication and red lamp blink in the viewfinder and the 🪫 indication blinks in the display window.
Replace the battery pack with the fully charged one.

B-5



Using the NP-22 battery pack
A fully-charged NP-22 battery pack can operate this unit for approximately 60 minutes. For using the NP-22, an optional NPA-22 battery adaptor is necessary.

Battery Case B-5

1 **Insert the six R6 (size AA) alkaline batteries into the battery case.**

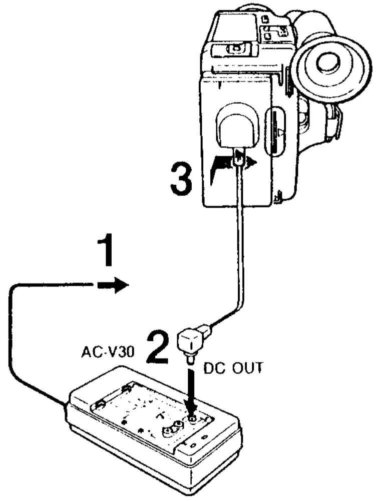
2 **Align the right side of the battery case with the line on the recorder, and while pressing the battery case, slide it to the right.**

To remove the battery case
While pressing the BATT knob on the recorder, slide to the left and pull out the battery case.

Battery life
With fully-charged batteries, the battery case provides approximately 30 minutes of continuous camera recording when used indoors.

Notes on the battery case
- The battery case cannot be used in a cold place.
- The ⌧ indication may not blink when the batteries in the battery case become weak, as the voltage of the battery lowers suddenly. If the cassette compartment does not open, replace the batteries.

B-6



House Current — Using AC Power Adaptor B-6

1 **Connect the AC power adaptor to a wall outlet.**

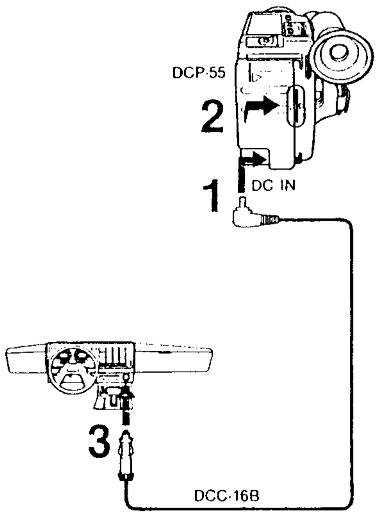
2 **Insert the connecting cord supplied with the AC-V30 AC power adaptor into the DC OUT jack on the AC power adaptor.**

3 **Align the right side of the connecting plate with the line on the recorder, and while pressing the connecting plate, slide it to the right.**

To remove the connecting plate for the AC power adaptor from the video camera recorder
While pressing the BATT knob on the recorder, slide to the left and pull out the connecting plate.

The optional AC-V55 AC power adaptor can also be used to operate this recorder on house current.

B-7



Car Battery — Using the DC Pack B-7

1 **Insert the DCC-16B car battery cord supplied with the DCP-55 pack into the DC IN jack on the DC pack.**

2 **Align the right side of the DC pack with the line on the recorder, and while pressing the DC pack, slide it to the right.**

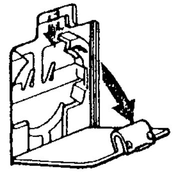
3 **Connect the DCC-16B car battery cord to the cigarette lighter socket of a car (12 V or 24 V).**

To remove the DC pack from the video camera recorder
While pressing the BATT knob on the recorder, slide to the left and pull out the DC pack.

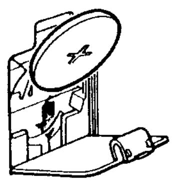
The optional AC-V55 AC power adaptor and the DCC-16AE a car battery cord can also be used to operate this recorder on a 12V or 24V car battery.

C-1

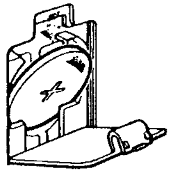
1



2



C-2



Lithium Battery C-1

To insert the lithium battery
This unit uses a lithium battery to activate the clock and to keep a title in memory. Before operating the unit for the first time, install the supplied lithium battery:

1 **Open the cover of the lithium battery compartment on the battery mounting surface.**

2 **Install the supplied CR2025 lithium battery with the ⊕ side facing out.**

3 **Close the cover.**

To remove the lithium battery C-2
Press the side of the battery in the direction as indicated for installation.

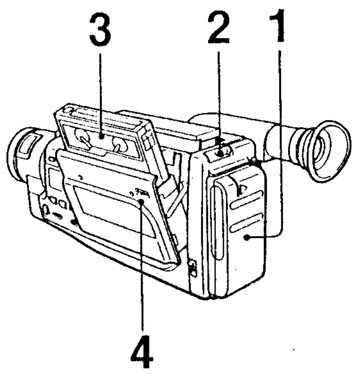
Lithium battery life
Approximately 1 year in normal operation.
When the lithium battery becomes weak, the time indication will blink in the display window and on the viewfinder screen for about 5 seconds.
In this case, replace the battery with a Sony CR2025.

Notes on lithium battery
- Keep the lithium battery out of the reach of children. Should the battery be swallowed, immediately consult a doctor.
- Wipe the battery with a dry cloth to assure a good contact.
- Be sure to observe the correct polarity when installing the battery.
- Do not hold the battery with metallic tweezers, otherwise a short-circuit may occur.
- Do not break up the battery nor throw it into a fire, which might cause it to explode. Carefully dispose of the used batteries.
- Even when the lithium battery is installed, the display window will not light unless power is supplied to the unit.

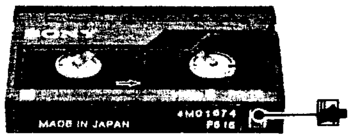
WARNING
Battery explode if mistreated.
Do not recharge, disassemble or dispose of in fire.

1-4. CASSETTE CARE

D-1



D-2



Cassette Insertion D-1

1 Connect a power source.

2 Pressing the small button, slide the EJECT button in the arrow direction.
The cassette holder will open.

3 Insert a cassette with the window facing outside.

4 Close the cassette holder.

Cassette Ejection D-1

1 Make sure that a power source is connected.

2 Pressing the small button, slide the EJECT button in the arrow direction.

3 Take out the cassette.

4 Close the cassette holder.

To Prevent Accidental Erasure D-2

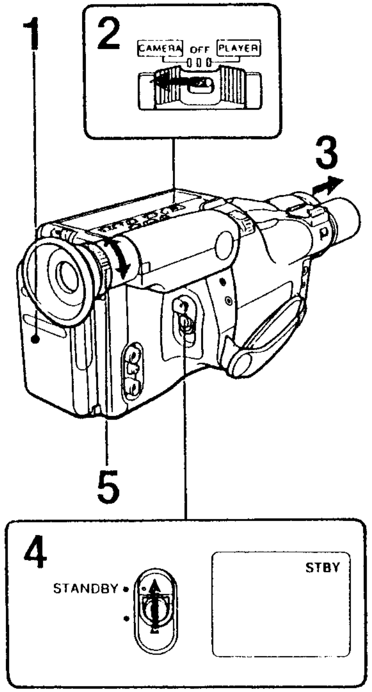
Slide out the tab on the cassette so that it covers the opening. (A red mark will appear.)

To re-record on the cassette, slide the tab in to uncover the opening.

Notes
- Don't press the upper lid of the cassette compartment forcibly when it is moving.
  When the cassette holder is pressed to close, the upper lid of the cassette compartment will automatically lower.
- Never insert anything in the small holes on the rear of the cassette. These holes are used to sense the kind of tape, thickness of tape, or if the tab is out or in, etc.
- To record from the beginning of the tape, run the video camera recorder for about 15 seconds at the beginning of a cassette before recording. It will avoid missing the starting point during playback on a video cassette recorder.

1-5. ADJUSTMENT OF THE POSITION OF THE VIEWFINDER LENS

E



The position of the viewfinder lens for optimum vision varies depending on the person. E

1 Connect a power source.

2 While pressing the small button, set the POWER switch to CAMERA.

3 Remove the lens cap.

4 Slide the STANDBY switch up.

5 Turn the viewfinder lens adjustment ring so that the indicator displayed on the viewfinder screen comes into sharp focus.

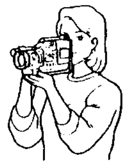
Adjustment of the position of the viewfinder lens is necessary only for your initial use, or for use after someone else.

Notes

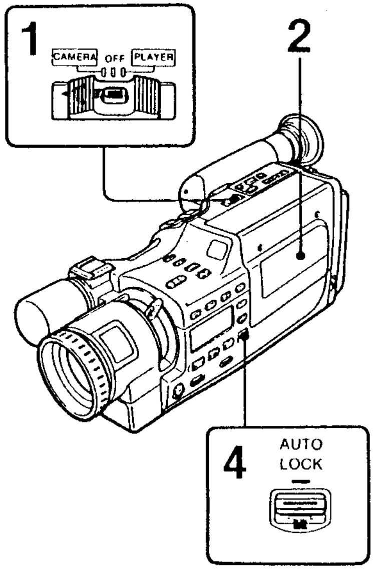
- **If you leave the unit in the recording pause mode for 5 minutes or more, the unit will be automatically turned off. To resume recording pause mode, slide the STANDBY switch down once and slide it up again.**
- For "once-only" events, it is strongly recommended to have a trial run to check that everything is working perfectly.
- PCM recording/playing is not possible with this unit. The PCM sound recorded or after-recorded with another recorder cannot be played back with this unit.

1-6. EASY CAMERA RECORDING WITH AUTOMATIC ADJUSTMENT

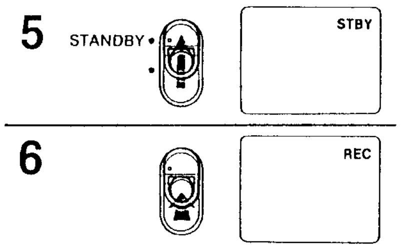
F-1



F-2



F-3



How to Record

Hold the camera recorder as in the illustration. If your nose touches the recorder, adjust the angle of the viewfinder. F-1

F-2

1 **While pressing the small button, set the POWER switch to CAMERA.**

2 **Insert the cassette.**

3 **Set the REC MODE/EDIT switch to LP or SP,** according to the length of the programme to be recorded.
The recording time of a cassette in the LP mode is twice as long as that in the SP mode.

4 **Set the AUTO LOCK switch to upper AUTO LOCK position.**

5 **Slide the STANDBY switch up.** F-3
The unit will enter the recording pause mode.

6 **Press the START/STOP button.**
Recording will start.

Check on the viewfinder screen
STBY: Displayed during recording pause mode.
REC: Displayed during recording.

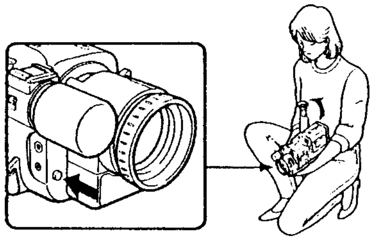
To stop recording
Press the START/STOP button again.
The unit will enter the recording pause mode.
Avoid rough handling or mechanical shock to the unit. A smooth transition between scenes may not be made.

To check the last portion of the previous recording

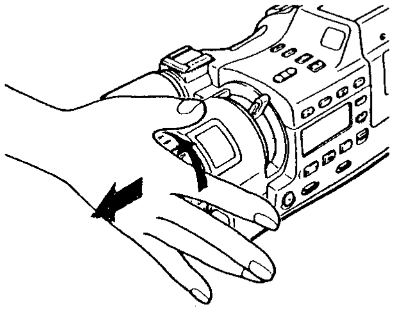
1 **Set the recorder in recording pause mode by pressing the START/STOP button.**

2 **Press the "−" side of the EDITSEARCH button (⊖) momentarily.**
The last few seconds of the recorded portion are rewound and then the recorded picture is monitored on the viewfinder screen. The unit then enters the recording pause mode.

F-4



F-5



If the picture has not been recorded
The video head may be contaminated. Clean the heads using the Sony V8-25CL video head cleaning cassette.

After using
Slide the STANDBY switch down and set the POWER switch to OFF. (You need not press the center button when setting the switch to OFF.)

F-4
For low position recording
The viewfinder can be turned up 90 degrees.

1 **Slide the STANDBY switch up.**

2 **Press the START/STOP button on the front.**

When removing the lens hood, press it with the palm of your hand and turn it counterclockwise. F-5

Note on power source
If the POWER switch is moved during recording, the tape will stop.

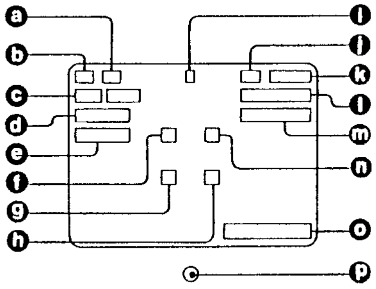
Notes on light sources
- Should you shoot a subject in bright conditions such as sunlight just after shooting in a dark place, the picture may not appear on the viewfinder screen. In this case, move the camera away from the subject to resume the normal condition.
- A vertical band may appear when a subject such as a candle flame or a light is shot against a dark background.

Notes on playback on another VTR
- To view the picture which has been recorded on this unit, set the monitor switch of the recorder for playback to the STD (standard) position.
- When recording on this unit using a tape on which PCM stereo sound has previously been recorded, set the monitor switch of the video cassette recorder for playback to the STD (standard) position. Otherwise, the sound may not be heard or may be distorted.

Notes on automatic adjustment
- During recording, do not cover the white balance sensor, infrared beam emitter and detector.
- During recording with auto focusing, do not turn or stop the focus ring forcibly.
- Keep the lens and the white balance sensor clean.

Under certain conditions, auto focusing will not operate properly (see page 25).

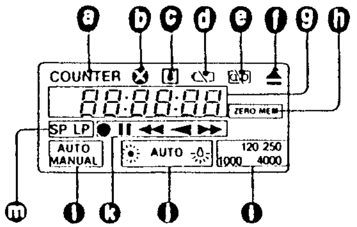
F-6



Indications inside the Viewfinder and in the Display Window F-6 F-7

ⓐ ▨ **(Back light)**
The indication lights while the BACK LIGHT button has been pressed.
ⓑ ☀, ☼ **(White balance)**
When the indication does not light, the white balance is set to auto.
ⓒ **Title number, mode and colour**
ⓓ **Shutter speed**
ⓔ **FADER**
ⓕ ▭
The indication blinks slowly when the battery is weak and blinks rapidly when the battery is exhausted.
ⓖ ▨ **(Dew)**
The indication blinks when moisture condensed inside the unit.
ⓗ ⏏
The indication blinks when the unit cannot function normally.
⊗
The indication blinks when the gap of the head is clogged. Clean the heads using the video head cleaning cassette.
ⓘ ■
The indication lights while manual focusing.
The indication blinks while auto focus function does not operate correctly.
ⓙ **SP/LP**
The indication of tape speed
ⓚ **STBY/REC**
The indication lights in the following modes.
STBY
Recording is momentarily stopped (recording pause mode).
REC
recording is going on.
ⓛ **Tape counter**
ⓜ **ZERO MEM**
The indication blinks when the ZERO MEM button is pressed.
ⓝ ▭ **(Tape end)**
The indication blinks slowly when the tape is out or close to the end. The indication blinks rapidly when the tape is at its end.
ⓞ **Date or Time**
ⓟ **Camera recording/battery lamp**
The indication lights during camera recording. It blinks when the battery is weak.

F-7



F-7

ⓐ COUNTER indicator
ⓑ Blinks when the slit in the head is clogged.
ⓒ Moisture condensation inside the unit.
ⓓ Blinks when the battery is weak.
ⓔ Lights steadily when no cassette is inserted. Blinks when the tape approaches its end or the safety tab of the inserted cassette is slid out (red).
ⓕ Light steadily during cassette ejection. Blinks when the unit cannot function normally.
ⓖ Indicates the date time or the tape counter.
ⓗ ZERO MEM (memory) indicator
ⓘ Shutter speed indicator
ⓙ White balance indicator
ⓚ Tape operation mode indicators
ⓛ Recording mode indicator
ⓜ Tape speed indicator

Function of the AUTO LOCK Switch

When the AUTO LOCK switch is set to upper AUTO LOCK position (green position), the white balance, shutter speed (1/50), and focus are adjusted automatically, and the back light function does not work. But under certain circumstances manual adjustment is better for effective recording.

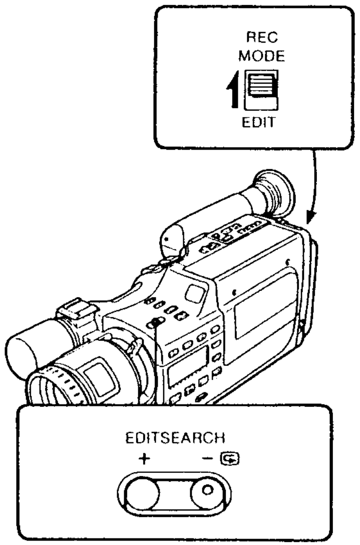
When the AUTO LOCK switch is set to the lower position, each manual function works as follows.

Each push of the button cyclically changes each function and the indication on the viewfinder and display window changes.	
WHITE BALANCE See page 28	No indication (Auto) → ☼ → ☼
SHUTTER SPEED See page 30	No indication (1/50) → 120 → 250 → 1000 → 4000
FOCUS See page 24	No indication (Auto) → ■ (Manual)
BACK LIGHT See page 29	No indication → ▨

Notes

- Just after the battery pack is attached to the recorder, even if the AUTO LOCK switch is set to the lower position, the AUTO LOCK function will work.
- If the AUTO LOCK switch is set to AUTO LOCK after each function is adjusted manually, and then set to the lower position again, the previous manual setting will be recalled.

F-8



Instant Playback on the Spot F-8

You can monitor the picture just recorded on the viewfinder screen.

1 **While pressing the small button, set the POWER switch to CAMERA.**

2 **Slide the STANDBY switch up.**

3 **Set the REC MODE/EDIT switch to the upper position.**

4 **Press the "−" side of the EDITSEARCH button to reverse the picture.**

5 **Press the "+" side of the EDITSEARCH button to view the playback picture.**

To resume recording in the LP mode, slide the REC MODE/EDIT switch down.

During Recording, to Record Again on the Previous Recorded Portion

1 **Slide the STANDBY switch up.**

2 **Set the REC MODE/EDIT switch to the upper position.**

3 **Locate the point from which the recording is to begin again by monitoring the picture on the viewfinder screen.**
❶ Press the "+" side of the EDITSEARCH button to advance the picture at a normal playback speed, or the "−" side to reverse the picture.
❷ At the desired point, release the EDITSEARCH button.
The unit will be set to recording pause mode.

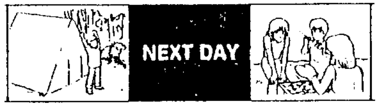
4 **Set the REC MODE/EDIT switch to the previous recording mode.**

5 **Press the START/STOP button to start recording.**

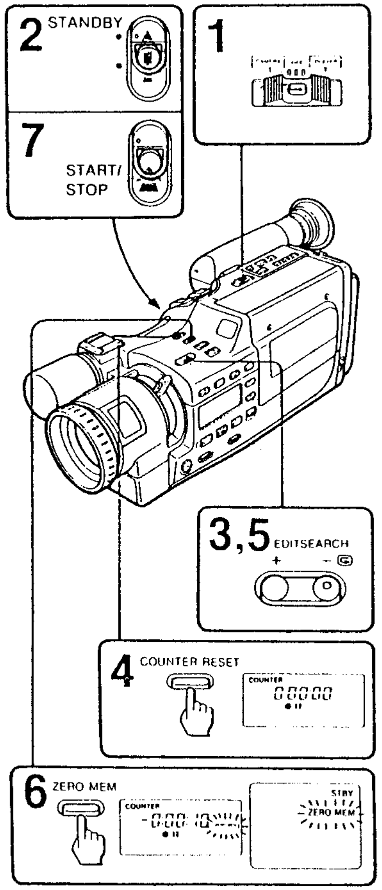
Smooth recording can be made even if the recording is stopped and started again, or even if the power is turned off and on again, provided that the cassette is not removed. But, if the cassette has been removed, proceed as above.

1-7. INSERT RECORDING

G-1



G-2



You can insert (record) video and audio simultaneously from the camera onto any recorded tape. G-1

Operation G-2

- Monitor the picture being inserted on the viewfinder screen.
- Select the same tape speed as was used for already recorded portion with the REC MODE/EDIT switch.

1 **While pressing the small button, set the POWER switch to CAMERA.**

2 **Slide the STANDBY switch up to set the unit to recording pause mode.**

3 **Keep pressing the "+" or "−" side of the EDITSEARCH button and release the button at the point where the insert should end.**
The unit will be set to recording pause mode.

4 **Display the counter in the display window and press the COUNTER RESET button.**
The counter is reset to zero.
(For an accurate ending point, press the COUNTER RESET button immediately after the EDITSEARCH button is released and while the still picture is displayed.)

5 **Keep pressing the "−" side of the EDITSEARCH button and release the button at the point where the insert should begin.**

6 **Press the ZERO MEM button.**
The insert ending point is stored in memory.

7 **Press the START/STOP button.**
Insert recording will begin.

The insert recording will stop automatically near the counter zero point.

To cancel ZERO MEM mode
Press the ZERO MEM button so that the ZERO MEM indicator disappears.

To insert the date or time
Follow steps 1 through 6 above, press the DATE or TIME button to display the date or time indication on the viewfinder screen and then press the START/STOP button.

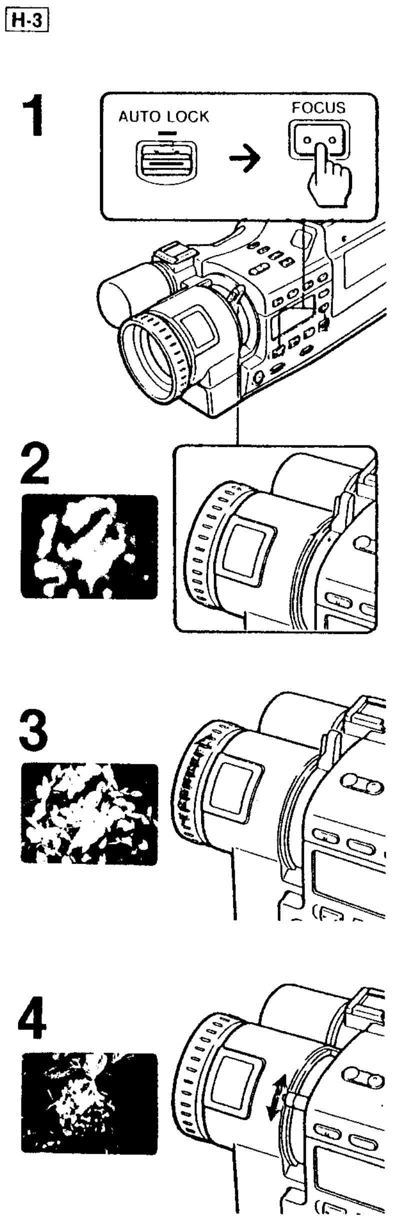
Notes on ZERO MEM Mode
ZERO MEM mode is cancelled automatically in the following cases.
- When an insert recording is completed.
- When the position of the POWER switch is changed.
- When the power is turned off.
- When the cassette is ejected.

To restore it, follow the steps 1 through 6 again

Notes
- When recording pause mode lasts for approximately 5 minutes, pause mode will be automatically released and the unit will be set to stop mode.
- When the inserted tape is played back, the picture may be distorted at the end of the inserted program.

1-8. MANUAL FOCUSING

H-3



Use manual focusing when shooting subjects difficult to focus automatically (listed on page 25).

H-1

1 **Set the AUTO LOCK switch down and press the FOCUS button to set the manual focusing.**
The previous manual focusing setting will be recalled.

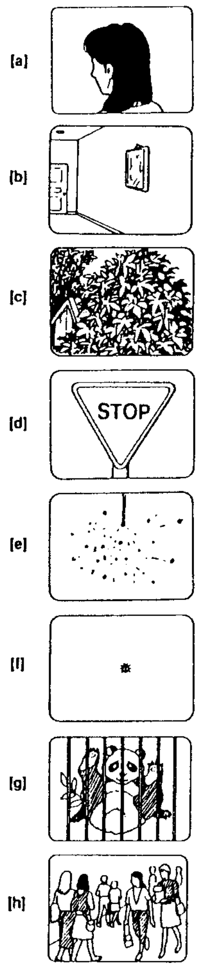
2 **Turn the manual zoom lever to the telephoto position (68) to make the subject as large as possible in the viewfinder.**

3 **Turn the focus ring to achieve sharp focus.**

4 **Set the desired shot length using the manual zoom lever.**

Some helpful hints
- When shooting a scene with lots of movement in bright light, the subject can be kept in good focus by setting the zoom lever to the wide-angle position (8.5) and the focus ring to 2 m, regardless of the distance between the subject and the recorder.
- When shooting in low light situations such as indoors, the depth of field in proper focus is very shallow. For best results, shoot at wide angles, after focusing in telephoto.
- The figures on the focus ring indicate the distance between the subject and the ⌽ mark.
- Recommended illumination of this unit is more than 300 lux (28 footcandles). If shooting is done indoors or under other circumstances where light is insufficient, video lights must be used for best results. Under adequate light condition, the depth of field in proper focus is wider and a sharper picture will be recorded.

H-2



Poor Conditions for Auto Focusing H-2

To shoot subjects listed below you must use manual focusing.

[a] Black objects which absorb the infrared beam
Ex. dark curtains or shade

[b] Objects in which the infrared reflection disperses
Ex. a smooth slanting surface (Auto focusing functions when the camera is aimed squarely at the subject.)

[c] Objects in which the infrared reflection is not sufficient
Ex. bushes, grass or plants in the telephoto position

[d] Objects in which the infrared beam is reflected too much
Ex. traffic signs, a white wall, a mirror, or a subject through plate glass

[e] Objects not solid
Ex. fireworks, candle flame or smoke

[f] Extremely small objects which do not cover more than $^{1}/_{10}$ of the viewfinder's area
Ex. insects

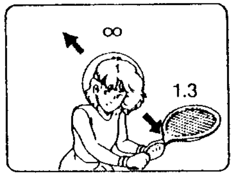
[g] When there are other objects between the shooting object
Ex. an animal inside a cage or baby inside a cot

[h] Moving objects
Ex. a crowd or sports with lots of movement

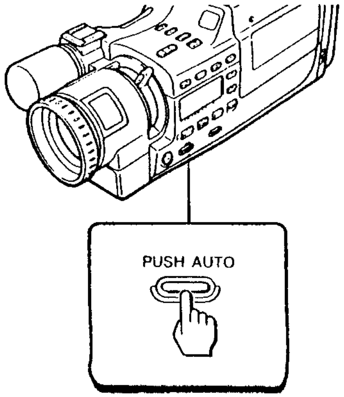
- **Objects which emit infrared beams themselves**
Ex. automatic doors or fluorescent lights

- **Objects more than 15 meters (49 feet) away from the recorder**

H-3



H-4



Other Uses of Manual Focusing

- When using special effects lenses or filters
- When shooting still subjects on a tripod
- To save battery wear
  (When the AUTO LOCK switch is set to upper AUTO LOCK position, the auto focusing operates to move the focus ring automatically even in recording pause mode. This causes the battery to wear continuously.)
- For focusing in close-up shooting, see page 33.

Auto focusing system of this camera recorder
This recorder adjusts focus automatically by emitting an infrared beam at the objects to be shot and then detecting the reflected beam. When the subject is approximately 3 meters away from the camera recorder, the focus is sharpest in the centre of the screen. The camera recorder has the tendency, however, to focus a bit lower to the right when the subject is within 3 meters, and a bit higher to the left when the subject is more than 3 meters away. H-3

Note
As the auto focusing of this camera recorder utilizes an infrared beam, it might malfunction when you use the camera recorder near another equipment that also emits an infrared beam such as a TV or VTR Remote Commander, or another camera recorder that uses an infrared beam for auto focusing.
It might also cause malfunctioning of such equipment.

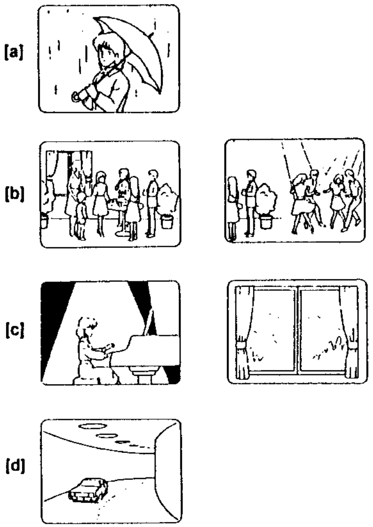
Instant Auto Focus during Manaul Focusing H-4

While recording in manual focusing, you can switch to the automatic focus mode, depending upon the shooting condition, by pressing the PUSH AUTO button. The automatic focus function is active while the button is pressed.

To return to the manual focusing, release the PUSH AUTO button.

1-9. WHITE BALANCE FUNCTION

I-1



Automatic White Balance Function

In most cases, the auto white balance function of this unit adjusts the white balance automatically. However, if it does not work correctly in the conditions listed below, adjust the white balance manually.

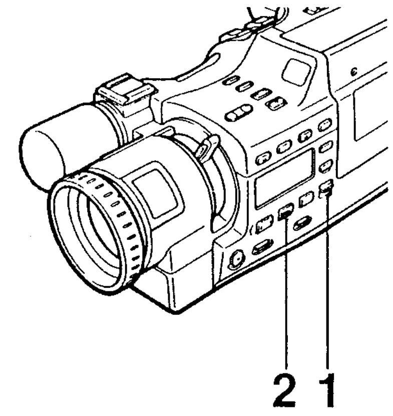
Manual White Balance Function

I-1

Poor condition for automatic white balance function are listed below.

[a] Insufficient light
[b] When lighting conditions change quickly
[c] When the light source for the subject is different from thet illuminating this unit e.g. when the subject is in a spotlight, or when the subject is outdoors but the camera is indoors, etc.
[d] Special light sources such as natrium lamps, the setting sun, etc.

I-2



How to Use the Manual White Balance Function I-2

1 **Set the AUTO LOCK switch down.**
The white balance mode is the same as the previous mode.

2 **Press WHITE BAL button once or twice so that the appropriate white balance indicator appears on the viewfinder screen.**
To record the subject indoors (3200 K): ✧
To record the subject outdoors (5800 K): ☀

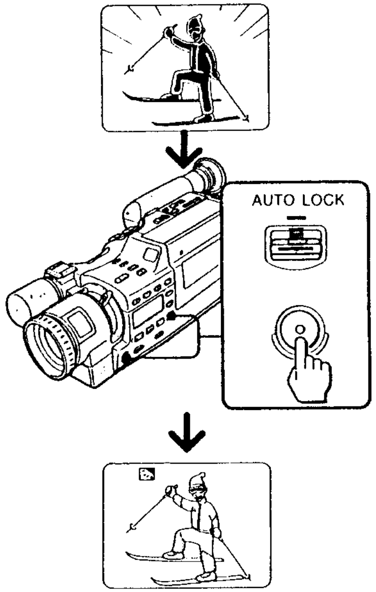
Recommended setting for various subjects
indoor: coming in from outdoor to indoor, candle flames in darkness, subjects in the spotlight, scenes before sunrise, subjects in a tunnel (illuminated by natrium lamps), neons, etc.
outdoor: getting out from indoor to outdoor, sunset, fireworks, subjects in a sunny window, etc.

Note
Do not cover the white balance sensor.

Each push of the WHITE BAL button cyclically changes each function.	
Display window	AUTO → ☀ → ✧ ↺
Viewfinder screen	No indication → ☀ → ✧ ↺

1-10. BACK LIGHT ADJUSTMENT J

J



In this unit iris is automatically controlled, however, when the shooting a subject that is a backlit, that is the light source is coming in from the back of the subject.

1 **Set the AUTO LOCK switch down.**
The previous back light mode which is before setting the AUTO LOCK switch to the upper position will be recalled.

2 **Press the BACK LIGHT button.**
The ◪ indication appears in the viewfinder screen.

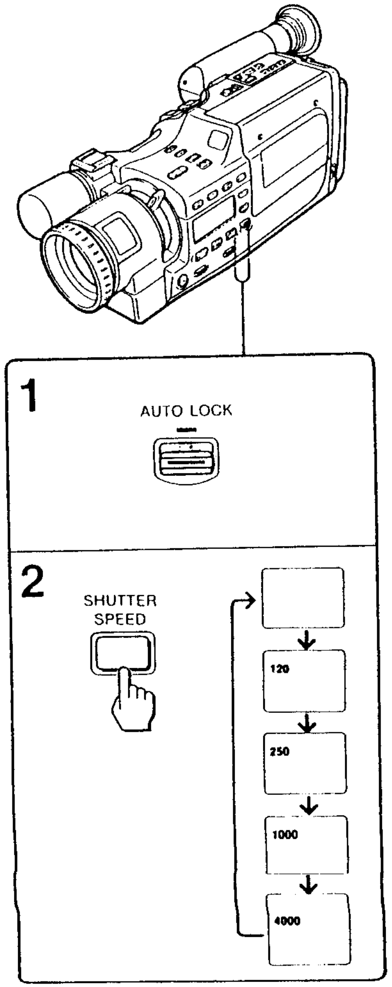
After shooting that particular scene, be sure to press the BACK LIGHT button again to release it. Otherwise the recorded picture will be too bright.
The ◪ indication goes out.

1-11. SHUTTER SPEED ADJUSTMENT

K-1

K-2

K-3



When a fast-moving subject is recorded at a normal shutter speed, its still picture may not be seen when played back K-1. This can be improved by increasing the shutter speed K-2. The shutter speed of this unit can be selected from five speeds, 1/50 (normal speed), 1/120, 1/250, 1/1000, 1/4000.
However, when the shutter moves fast, it will not allow enough light to come into the lens, so the picture will be dark. Therefore, when recording at a high shutter speed, record in a brighter place than usual.
Choose an appropriate shutter speed according to the place and situation.
See the chart below for examples.

Example use	Recommended shutter speed
• On clear days, recording golf or tennis scenes (To view the hit ball clearly in the pause mode, set to 1/4000) • Recording the skiers	1/4000 or 1/1000
• On overcast days, recording a moving merry-go-round or jet-coaster • Recording outdoors from inside a vehicle (for stable shooting)	1/250
• Instead of the ND2 filter (To reduce the exposure level to approx. 1/2) • Recording indoors (for stable shooting)	1/120

K-3

1 **Set the AUTO LOCK switch down.**
The previous shutter speed mode which is before setting the AUTO LOCK switch to the upper position will be recalled.

2 **Press the SHUTTER SPEED button repeatedly until the desired shutter speed indication appears on the viewfinder screen and in the display window.**
Each time the SHUTTER SPEED button is pressed, the indication changes:

No indication → 120 → 250 → 1000 → 4000
(1/50) (1/120) (1/250) (1/1000) (1/4000)

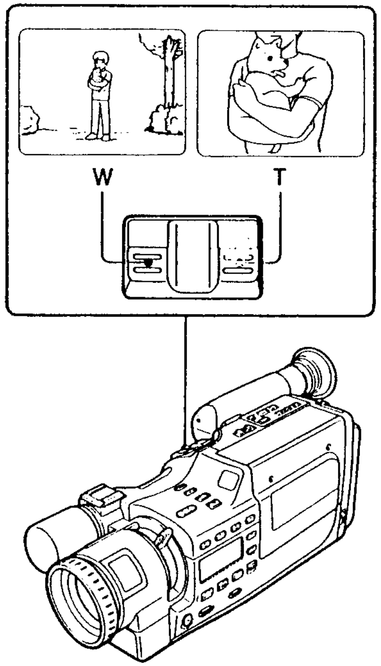
When the picture in the viewfinder is dark at the high shutter speed, auto focus will not function correctly. In this case, use the manual focusing.

Notes

- When shutter speed 1/250 or more is selected, recording must be done under sunlight or video light.
- When the recording is done under a light discharged tube, such as a fluorescent lamp, sodium lamp, or mercury lamp, the brightness of the recorded picture may vary ("flicker").
  If flickers of fluorescent lamps affect the recording in 60 Hz areas, set the shutter speed to 1/120.
- When the shutter speed is changed during a camera recording of a TV screen, the brightness of the recorded picture may vary.
- When a very bright object is shot at a faster shutter speed, a light, vertical, belt-like line ("smear") may appear on the screen.

1-12. ZOOMING

L-1



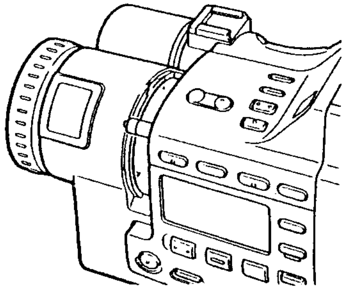
The size of the subject in the scene can be changed.

Power Zoom L-1

— for smooth and constant zooming

Press the "T" side of the power zoom button for telephoto and the "W" side for wide-angle. The zoom lever will move automatically.

L-2



Manual Zoom L-2

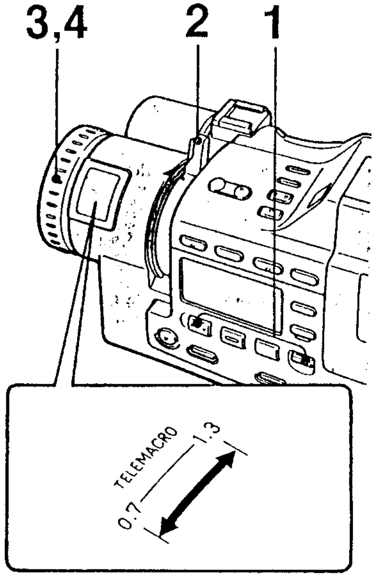
— to create a dramatic effect

Turn the manual zoom lever upward for telephoto and downward for wide-angle.

Zooming effect
The focal length of this unit is 8.5 mm to 68 mm. Converted into the focal length of a 35 mm camera, this means approximately f-43 mm to 340 mm.

1-13. CLOSE-UPS (MACRO)

M-1



Even tiny objects can literally fill the screen for dramatic close-up effects.
Remove the lens hood before operation.

Tele-Macro Shooting M-1

Using this setting, you can obtain close-up effects within 0.7 to 1.3 meters from the subject.

1 **Set the AUTO LOCK switch down and press the FOCUS button to set to the manual focusing.**

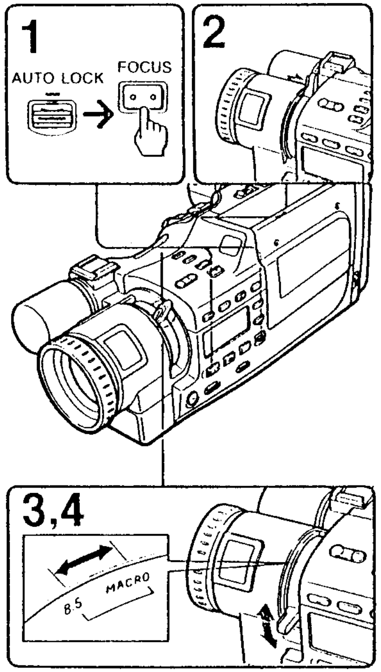
2 **Turn the zoom lever to the telephoto end position** (68).

3 **Turn the focus ring within the TELEMACRO range** (1.3–0.7).

4 **Turn the focus ring to bring the subject into sharp focus.**

Note
If you turn the zoom lever from the telephoto end position to wide, the screen may become dark.

M-2



Wide-Macro Shooting M-2'

The subject can be as close as 1 cm. A dramatic close-up effect can be obtained with a deeper field than that of the tele-macro shooting.

1 **Set the AUTO LOCK switch down and press the FOCUS button to set to the manual focusing.**

2 **Turn the zoom lever to the wide-angle position.**

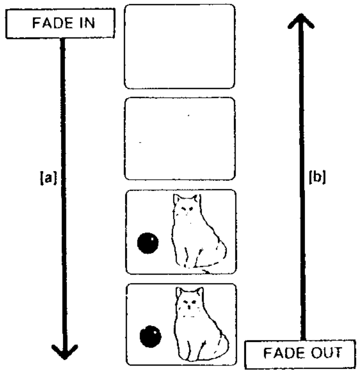
3 **Turn the zoom lever to the MACRO range, while pressing the green macro set button.**

4 **Turn the zoom lever within the MACRO range in order to focus sharply.**

Notes
- When shooting in macro, the depth of field is very shallow, so care must be taken to focus sharply. To keep the subject in focus, use a tripod or monopod to maintain stable picture.
- Zooming is not possible during wide-macro recording. To change the size of the subject, move the camera recorder closer or further away.

1-14. FADE-IN AND FADE-OUT FUNCTION

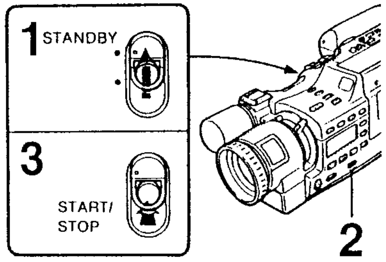
N-1



N-1

When fade-in, the picture and sound will gradually fade-in from a white background [a].
When fade-out, the picture and sound will gradually fade out to white. [b]
A natural beginning and ending effets can be added by using fade-in at the beginning of a recording and fade-out at the end of a recording.

N-2



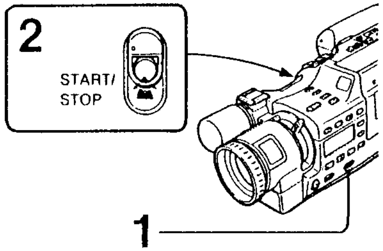
How to Fade-in N-2

1 **Slide the STANDBY switch up to set the unit to the recording pause mode.**

2 **Press the FADER button.**

3 **Press the START/STOP button.**
Fade-in will be performed and recording will start.

N-3



How to Fade-out N-3

1 **While recording, press the FADER button.**

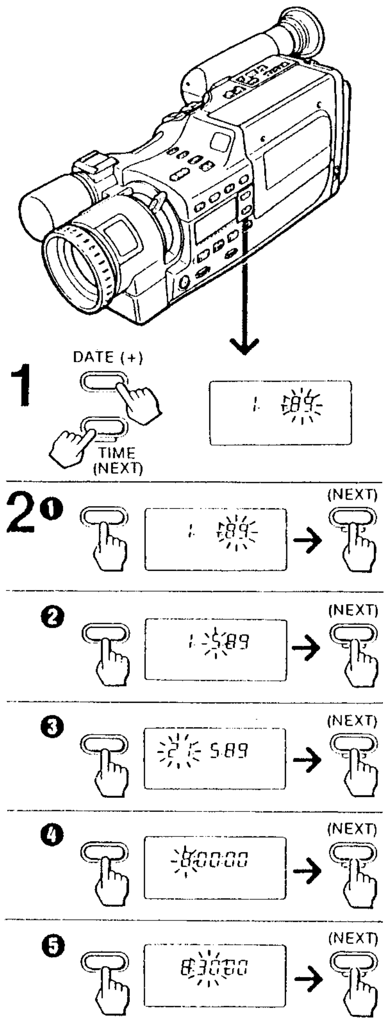
2 **Press the START/STOP button.**
Fade-out will be performed and then recording will stop.

To cancel the fade-in and fade-out function
Before pressing START/STOP button, press the FADER button again.

Note
Fade-in or fade-out is cancelled automatically after it has been performed.

1-15. RECORDING DATE OR TIME

O-1



Once the date and the current time are adjusted, the date or time can be recorded together with the picture.

Before setting the date and time, make sure that power sources and lithium battery are installed.

If you install a new lithium battery, re-set date and time again.

To Set Date and Time O-1

1 **Press the DATE and TIME buttons simultaneously for more than 3 seconds.**
The date indication will appear in the display window (date/time setting mode.)
The DATE button now functions as the + button and the TIME button functions as the NEXT button.

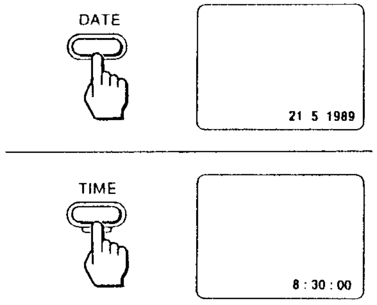
2 **Adjust ❶ year, ❷ month, ❸ day, ❹ hour and ❺ minute in sequence, following the illustration.**
First adjust the blinking digits with the + button, and then press the NEXT button. After adjusting the minute digits, press the NEXT button at the same time with an announced time signal.

The clock starts operating. There is no need to readjust the date and time as long as the lithium battery remains.

The + button can be pressed in two ways
- When you keep the button pressed, the digits will advance continuously.
- When you press and immediately release the button, the digits will advance by one.

To clear the time indication from the display
Press the TIME (NEXT) button again.

O-2



To check the preset date and time
Press the DATE or TIME button in the recording pause mode. When the same button is pressed again, the indication goes out.

To readjust an incorrect date or time
Set the unit to date/time setting mode and press the NEXT button repeatedly until the incorrect digit blinks. Correct it with the + button and press the NEXT button. After adjusting the minute digits, press the NEXT button at the same time with an announced time signal.

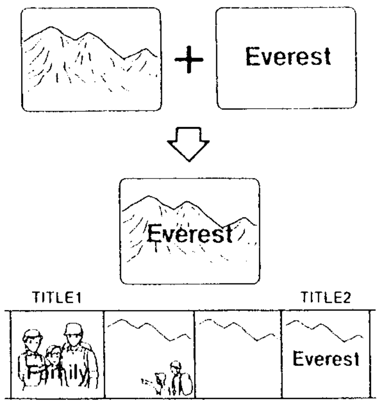
To Record the Date or Time O-2

During camera recording or in recording pause mode, press the DATE or TIME button to display the date or time on the viewfinder screen.
The date or time being displayed will be recorded together with the picture.

To stop recording the date or time
Press the DATE or TIME button again. The picture recording will continue.

1-16. RECORDING A TITLE

P-1



Before recording, memorize a title or figure. The memorized title or figure is superimposed onto the picture being recorded. P-1

- 4 kinds of titles or figures can be memorized.
- The colour of the title or figure can be selected from 8 colours.

Make sure that the lithium battery is installed. See page 14.

Preparations

To make a desired title card

- Use a white and plane card and draw the title on it with a deep colour (black is recommended for the best result) in thick letters.
  If contrast is clear, a signboard can be memorized like the title card.
- When deciding the title size, check the effective picture size on your video monitor.

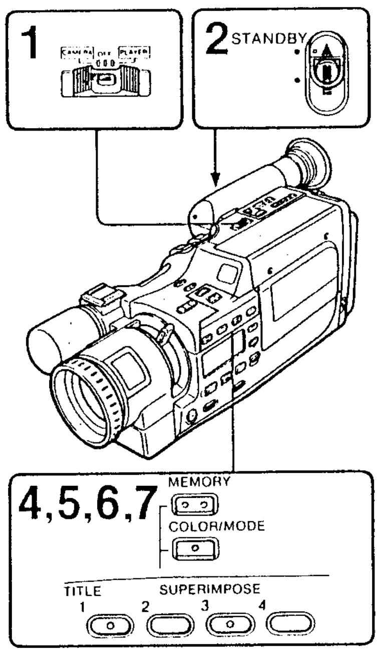
Before memorizing the title

- Fix the title card and the video camera recorder.
- Use of an appropriate light is recommended for a better result.

Function of the COLOR/MODE button
This button is used to select the title colour or title mode.

When the title is displayd	When the title is not displayed
Used as the COLOR button.	Used as the MODE button.
→ WHT (white) → BLUE → GRN (green) → CYAN BLK (black) ← YEL (yellow) ← VIO (violet) ← RED ←	→ No title mode → → ↑ → 🅃 → 🅃↑ → ↑: title scroll mode 🅃: title reverse mode 🅃↑: title reverse and scroll mode
Each push of the COLOR/MODE button cyclically changes the colour or mode	

P-2



To Memorize the Title P-2

1 **While pressing the small button, set the POWER switch to CAMERA.**

2 **Slide up the STANDBY switch to set the unit in the recording pause mode.**

3 **Point the camera to the title card and adjust the focus.**

4 **Press the TITLE 1, 2, 3 or 4 button.**

5 **Press the MEMORY button to memorize the title.**

6 **Select the title colour while observing the colour indication in the viewfinder.** Each push on the COLOR/MODE button cyclically changes the colour, as follows:

WHT (white) → BLUE → GRN (green) → CYAN
↑ ↓
BLK (black) ← YEL (yellow) ← VIO (violet) ← RED

7 **Press the TITLE 1, 2, 3 or 4 button (pressed in step 4) to turn off the title.**

Notes

- The colour indication in the viewfinder is not recorded on the tapes.
- You can change the title colour even after starting the recording.

To check the title
To check the memorized title, press the TITLE 1, 2, 3 or 4 button. To turn off the title, press the button again.

To Record the Title

To record the title from the beginning
Press the TITLE 1, 2, 3 or 4 button in recording pause mode, and then start recording.

To record during camera recording
Press the TITLE 1, 2, 3 or 4 button at the point from which the title is to be inserted.
The memorized title will be recorded together with the picture.

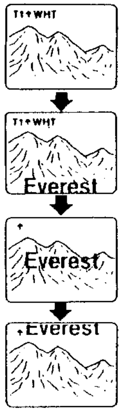
To stop recording the title
Press the TITLE 1, 2, 3 or 4 button again. The picture recording will continue.

To record the same title several times
By repeating the above procedure, you can record the title as many times as desired.

To Scroll the Title from Bottom to Top

During recording, the memorized title can be scrolled from bottom to top. P-3

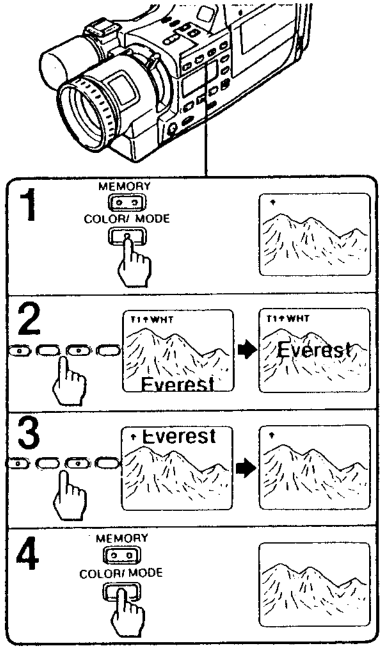
P-3


T1+WHT
T1+WHT
Everest
Everest
Everest

To check the scrolled title P-4

1. **In the recording pause mode, press the COLOR/MODE button.**
   The arrow mark will be displayed.
2. **Press the TITLE 1, 2, 3 or 4 button.**
   The title will be displayed from bottom to center.
3. **Press the TITLE 1, 2, 3 or 4 button again.**
   The title will be displayed from centre to top.
4. **Press the COLOR/MODE button three times.**
   The arrow mark will disappear.

P-4


1
MEMORY
COLOR/ MODE
2
T1+WHT
Everest
T1+WHT
Everest
3
Everest
4
MEMORY
COLOR/ MODE

To record the scrolled title

1 **In the recording pause mode, press the COLOR/MODE button.**
The arrow mark will be displayed.

2 **Start the camera recording.**

3 **Press the TITLE 1, 2, 3 or 4 button at the point from which the scrolled title is to be recorded.**

4 **After the title stops at the centre of the picture, press the TITLE 1, 2, 3 or 4 button again.**
The title is scrolled from centre to top.

To clear the scroll mode
After recording, press the COLOR/MODE **button three times.**

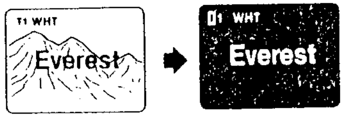
If you do not want to record the picture for the background
Point the recorder to a white, flat object such as a white wall, paper, etc.

To change the colour of the title
While the title is being displayed, press the COLOR/MODE button.

To Reverse the Title and the Background

The colour scheme of the title and the background can be reversed. P-5

P-5



To check the reversed picture P-6

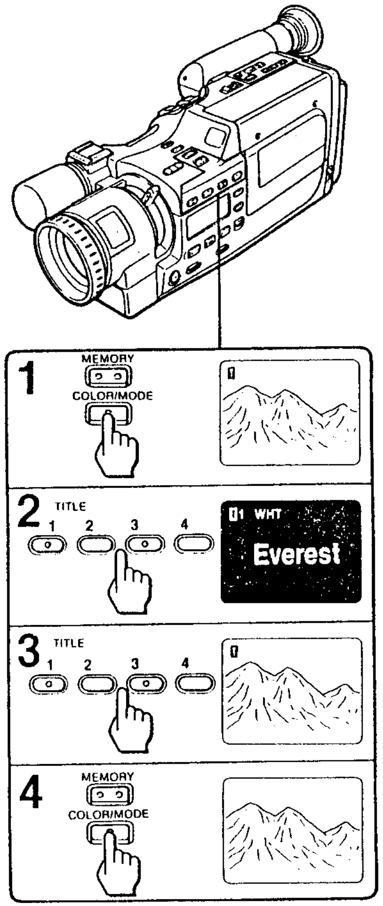
1 **In the recording pause mode, press the COLOR/MODE button twice.**
The T mark will be displayed.

2 **Press the TITLE 1, 2, 3 or 4 button.**
The reversed title and background will be displayed.

3 **Press the TITLE 1, 2, 3 or 4 button again.**

4 **Press the COLOR/MODE button twice.**
The T mark will disappear.

P-6



To record the reversed picture from the beginning

1 **In the recording pause mode, press the COLOR/MODE button twice.**
The T mark will be displayed.

2 **Press the TITLE 1, 2, 3 or 4 button.**

3 **Start the camera recording.**

4 **Press the TITLE 1, 2, 3 or 4 button again to clear the reversed picture.**

To record the reversed picture during recording

1 **In the recording pause mode, press the COLOR/MODE button twice.**
The T mark will be displayed.

2 **Start the camera recording.**

3 **Press the TITLE 1, 2, 3 or 4 button at the point from which the reversed picture is to be recorded.**

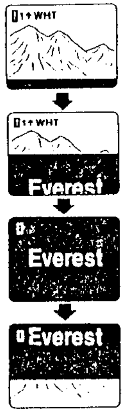
4 **Press the TITLE 1, 2, 3 or 4 button again to clear the reversed picture.**

To clear the reverse mode
After recording, press the COLOR/MODE button twice.

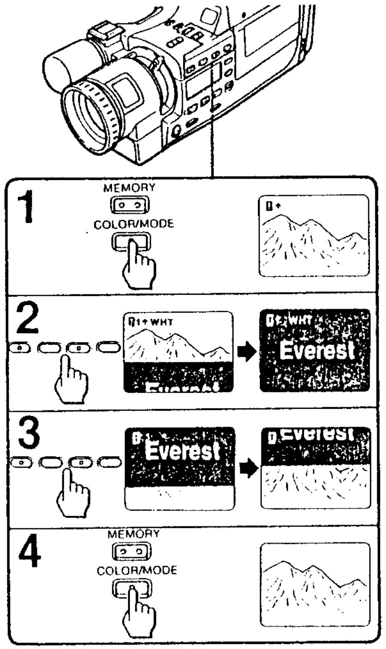
If you do not want to record the picture for the background
Point the recorder to a white, flat object such as a white wall, paper, etc.

To change the color of the background
While the title is being displayed, press the COLOR/MODE button.

P-7



P-8



To Scroll the Reversed Title P-7

To check that the reversed title is scrolled P-8

1 **In the recording pause mode, press the COLOR/MODE button three times.**
The arrow mark and the T mark will be displayed.

2 **Press the TITLE 1, 2, 3 or 4 button.**
The reversed picture will be displayed from bottom to centre.

3 **Press the TITLE 1, 2, 3 or 4 button again.**
The title will be displayed from centre to top.

4 **Press the COLOR/MODE button once.**
The marks will disappear.

To record the reversed and scrolled title

1 **In the recording pause mode, press the COLOR/MODE button three times.**
The arrow mark and the T mark will be displayed.

2 **Start the camera recording.**

3 **Press the TITLE 1, 2, 3 or 4 button at the point from which the reversed and scrolled title is to be recorded.**

4 **After the reversed title stops at the centre of the picture, press the TITLE 1, 2, 3 or 4 button again.**
The reversed title is scrolled from centre to top.

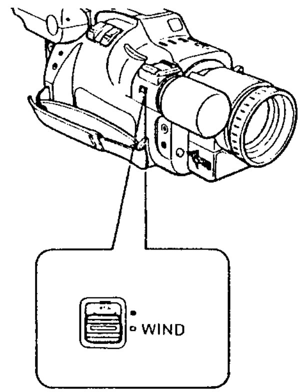
To clear the reverse mode
After recording, press the COLOR/MODE button twice.

If you do not want to record the picture for the background
Point the recorder to a white, flat object such as a white wall, paper, etc.

To change the colour of the background
While the title is being displayed, press the COLOR/MODE button.

1-17. USE OF THE BUILT-IN MIC SWITCH

Q



The built-in microphone is a uni-directional microphone which picks up specific sounds from the direction that the microphone is pointed at.

To reduce wind noise during recording Q
To avoid recording noise caused by strong wind.
Set the BUILT-IN MIC switch down. Normally set to the upper position.

A variety of optional microphones.

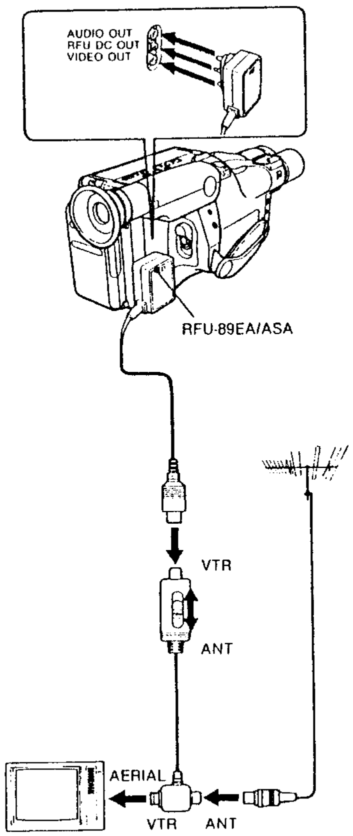
- Omni-directional microphone: To pick up sounds equally from all directions
- Uni-directional microphone: To pick up specific sounds
- Supercardioid microphone: To isolte a sound
- Zoom microphone: To allow the field of recording to be changed.

Note

- The built-in microphone will not operate when an optional microphone is connected to the MIC jack.
- When using an optional microphone, the BUILT-IN MIC switch does not work.

1-18. PREPARATION FOR PLAYBACK

R-1



Connecting a TV without audio/video input connectors R-1

1 **Connect the RFU-89EA/ASA RFU adaptor to the CCD-F500E.**

2 **Connect the aerial, CCD-F500E and TV to the aerial selector** (supplied with the RFU-89EA/ASA).
Use a 75-ohm coaxial cable for aerial connection.

3 **RFU-89EA only:** Set the I/G selector according to the TV system of your country.

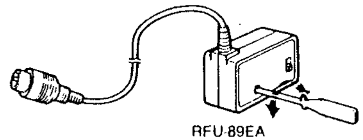
4 **Adjust one of the TV programme positions to receive the signal from the video camera recorder.** See "Adjusting the TV" below.

5 **Set the selector switch on the aerial selector as follows:**

For viewing a playback picture → VTR
For viewing TV programmes → ANT

6 **Select the same programme position on the TV as that selected in adjusting the TV.**

R-2



Adjusting the TV with the RFU-89EA

1 Turn on the TV and select a programme position which is not being used to receive a TV station.

2 Set the POWER switch of the CCD-F500E to CAMERA and slide the STANDBY switch up.

3 Set the selector switch of the aerial selector to VTR.

4 Tune the TV until you see the picture and hear the sound from the CCD-F500E.

If the playback picture is not free of disturbance

1 Set the selector switch of the aerial selector to ANT.

2 Adjust the programme position of the TV to a channel between UHF channels 30 and 39 with the tuning control or the fine tuning control on the TV, so that the TV screen shows no picture and so that a steady rustling sound or no sound is heard.

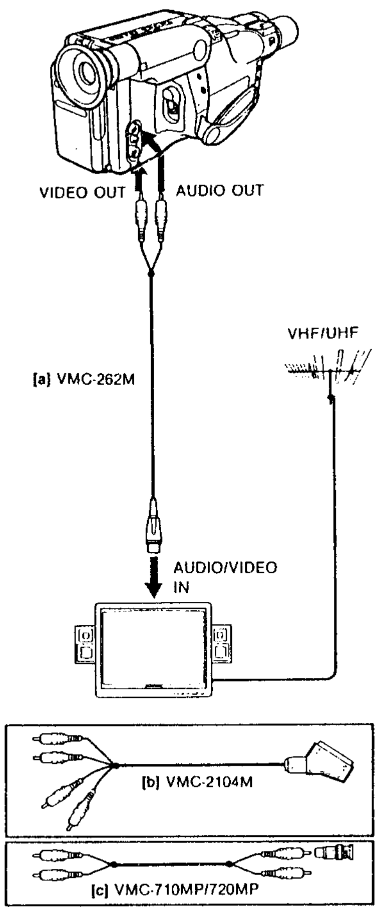
3 Set the selector switch of the aerial selector to VTR.

4 Slowly turn the RF channel of the RFU-89EA with the supplied screwdriver, until the picture from the CCD-F500E becomes clear. R-2
Now the TV adjustment is complete.

Adjusting the TV with the RFU-89ASA

Select the CHANNEL selector on the RFU-89ASA to 0 CH or 1 CH, whichever is not active in your area, and select the same channel on the TV.

R-3



Connecting a TV (or colour monitor) equipped with audio/video input connectors R-3

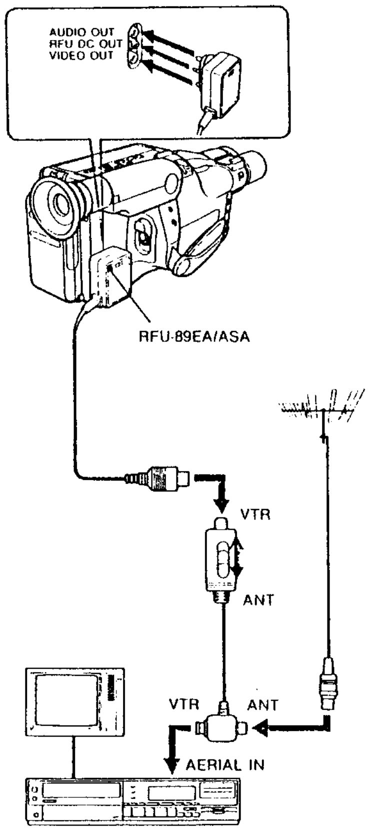
Leave the TV aerial cable connected to the TV.

1 **Connect the CCD-F500E to the TV using an optional connecting cable to match the connectors on the TV.**
[a] VMC-262M: to a 6-pin DIN connector
[b] VMC-2104M: to a 21-pin connector (EUROCONNECTOR)
[c] VMC-710MP/720MP: to phono and BNC-type connectors

2 **Set the TV/VIDEO selector button on the TV as follows:**

For viewing a playback picture → VIDEO
For viewing TV programmes → TV

R-4



Connecting a TV connected to another VTR without an input selector R-4

Connect the RFU-89EA/ASA RFU adaptor to the CCD-F500E.

1 **Connect the RFU-89EA/ASA, aerial, and the VTR to the aerial selector** (supplied with the RFU-89EA/ASA).
Use a 75-ohm coaxial cable for aerial connection.

2 **RFU-89EA only:** Set the I/G selector according to the TV system of your country.

3 **Adjust one of the TV programme positions to receive the signal from the video camera recorder. See "Adjusting the TV" on page 48.**

4 **Set the selector switch on the aerial selector as follows:**

For viewing a playback picture → VTR
For viewing TV programmes and playback picture of the VTR → ANT

5 **Select the same channel on the TV as that selected in adjusting the TV.**

Connect the others as shown in the illustration.

Playback

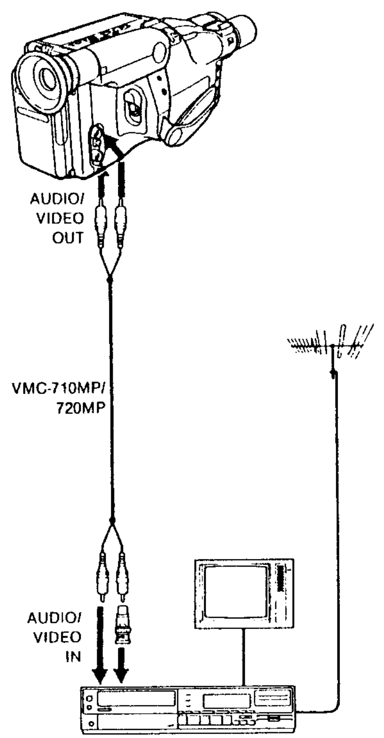
1 **Turn on the TV.**

2 **While pressing the small button, set the POWER switch on the CCD-F500E to PLAYER.**

3 **Set the selector switch on the aerial selector to VTR and select the channel for the VTR on the TV.**

4 **Insert a cassette into the CCD-F500E and press the ◁ button. Playback will start.**

R-5



Connecting a TV connected to another VTR with an input selector R-5

Use the optional VMC-710MP/720MP connecting cord.

Set the selector on the VTR as follows:
Input selector → LINE
TV/VTR selector → VTR

Note
When the VTR to be connected has stereo audio inputs, use the optional VMC-910MSP/920MSP connecting cord.

Playback

1 **Turn on the VTR and TV.**

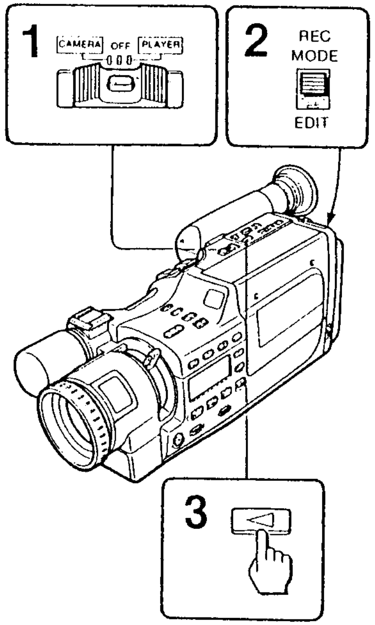
2 **While pressing the small button, set the POWER switch on the CCD-F500E to PLAYER.**

3 **Set the input selector on the VTR to LINE and select the channel for the VTR on the TV.**

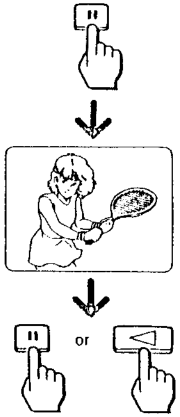
4 **Insert a cassette into the CCD-F500E and press the ◁ button. Playback will start.**

1-19. PLAYBACK

S-1



S-2



Turn on the TV (or colour monitor), and select the programme position for viewing a playback picture (or set the TV/VIDEO selector to VIDEO).

S-1

1 **While pressing the small button, set the POWER switch to PLAYER, and insert a cassette.**

2 **Set the REC MODE/EDIT switch in the upper position.**
The unit detects the recorded mode of the tape, and adjust the tape speed automatically.

3 **Press the ◁ button.**
Playback will start.

To stop the tape, press the □ button.

After using, be sure to set the POWER switch on the recorder to OFF.

To view a still picture S-2
Press the ❚❚ button during playback. To resume playback, press the ❚❚ button again or the ◁ button.

Monitoring a High-Speed Picture

During playback — Picture Search

1 **In the playback mode, press the ◀◀ or ▶▶ button.**
The picture will be monitored at high speed as long as it is kept pressed.

2 **Release the ◀◀ or ▶▶ button at the desired point.**
Normal playback will resume.

To View the Frame-by-Frame Playback Picture

Press the ◀❚❚ button during in still picture mode.
To resume normal playback, press the ◁ button.

If you release the ◀❚❚ button, the picture enters the still mode.

To View the Slow Motion Picture

Press the ◀❚ button during playback or in still picture mode.
To resume normal playback, press the ◁ button.

Notes
- If you move the position of the POWER switch during playback, the tape will stop.
- When the pause mode lasts for 5 minutes or more, the unit will automatically enter the stop mode.
- Streaks will appear and the sound will be muted in the high-speed picture.
- When a tape is recorded in SP mode, a still picture and high-speed picture may be noisy with many streaks and become black and white. Streaks will be wider than those of an LP recorded tape.

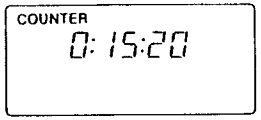
To adjust the frame-by-frame and slow playback pictures
In slow playback mode, press the "+" or "−" side of the EDITSEARCH button until a clear picture is obtained.
Repeat adjusting until a still picture is displayed clearest.

To adjust the still picture
If the still picture appears to shake, press the "+" or "−" side of the EDITSEARCH button until the picture stabilizes.

Note
The adjustment is retained in memory as long as the lithium battery is installed. Readjustment is only required when the equipment used for playback is changed or when tapes recorded on other equipment are played back on this unit.
The noise may not be eliminated completely when a tape recorded on other equipment is played back in still or slow picture mode.

1-20. USE OF THE TAPE COUNTER

T-1



During recording or when a tape recorded in the SP mode is played back, the digits on the counter indicate the actual recording or playback time. When a tape recorded in LP mode is played back, the counter counts approximately half the actual playback time.

E.g. When the counter indicates "0:15:20" during playback of an LP recorded tape, the tape was played back for approximately 30 minutes 40 seconds from the counter zero position. T-1

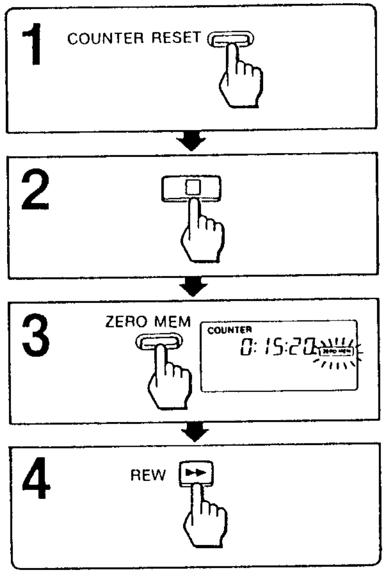
To Index the Whole Tape

Press the COUNTER RESET button at the beginning of the tape so that the counter shows "0:00:00". By noting the counter reading at a particular point, you can easily find that point later by referring to the tape counter.

Notes

- The counter reading and the point of the tape may not correspond exactly.
- The counter also operates for a blank, unrecorded portion of a tape.
- There will be a time lag of several seconds on the counter reading after repeated fast-forward and rewind operations or after playing back in slow mode for a long time.

T-2



To Return to a Pre-registered Point T-2

1 During recording or playback, press the COUNTER RESET button at the point you later want to locate.

2 Press the ☐ button when the recording or playback has finished.

3 Press the ZERO MEM button. The "ZERO MEM" indicator will blink in the display window.

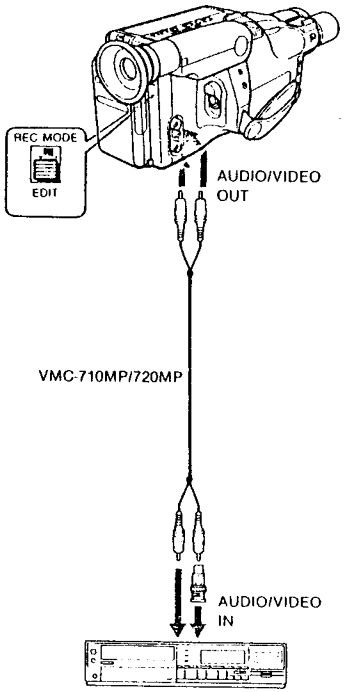
4 Press the ▶▶ or ◀◀ button.
The tape will be rewound or sent forward and stop automatically when the counter reaches approximately zero.

Notes

- The ZERO MEM button does not function during recording or playback mode.
- Be sure to press the ZERO MEM button when the tape is stopped.
- The ZERO MEM mode is cancelled automatically once the tape is rewound or sent forward to zero.

1-21. TAPE EDITING

U



To edit a home movie tape, you will need another VTR.

To Edit from the CCD-F500E to Another VTR U

1 **While pressing the small button, set the POWER switch on the CCD-F500E to PLAYER and turn on the other VTR.**

2 **Slide the REC MODE/EDIT switch on the CCD-F500E to EDIT.**

3 **Set the input selector on the VTR to LINE.**

4 **Press the II button on the CCD-F500E during playback at the point where you want to start recording.**

5 **Press the record button on the other VTR, pressing the II button.**

6 **Release the II buttons on both units.** Recording will start.

When the VTR to be used is a stereo type, use the VMC-910MSP/920MSP connecting cord.

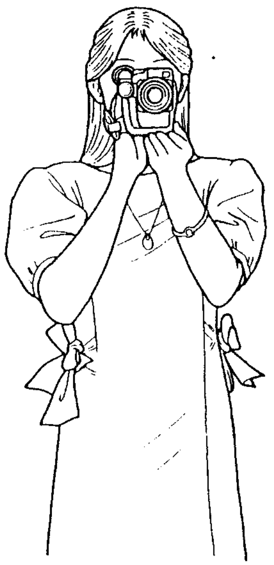
After editing, turn off both units and be sure to slide the REC MODE/EDIT switch to the upper position.

To cut off an unnecessary portion
Press the II button on the recorder at the beginning of the unnecessary portion.
Release it where you want to resume recording.

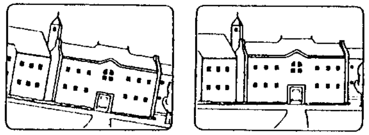
Function of the REC MODE/EDIT switch
Slide this switch down whenever you edit tapes. Signal loss that results from tape-to-tape transfer will be reduced, achieving more accurate signal transfer.
When recording or playing back normally, keep this switch in the upper position.

1-22. HINTS FOR BETTER SHOOTING

A



B



Basic Camerawork

Getting stable pictures A

For hand-held shots, holding the recorder properly is the key.

- Hold the recorder firmly and secure it with the grip strap so that it is easy to manipulate the recorder with your thumb.
- Breathe gently.
- Place your right elbow firmly against your side.
- Stand opposite to the subject and plant your feet firmly in a comfortable position.
- Place your eye firmly against the viewfinder eyecup.
- Try to keep both eyes open.
- Place your left hand under the camera recorder to support it. When adjusting the focus manually, make sure the unit does not move.
- Do not cover the white balance sensor and infrared beam detector and emitter.

Use a tripod or monopod if possible

If you have a tripod for your still camera, it can also be used with the video camera recorder. Use a sturdy one.
If a tripod is not available, try placing the camera on a tabletop, wall, or any other flat surface of suitable height.

Keeping the horizontal plane level B

Even if camera work is smooth and stable, shots can be tilted or off axis horizontally.

The horizontal plane can be easily determined by using the viewfinder frame as a reference.

Lighting

Try to shoot scenes with the sun at your back

When shooting a scene when the light source is in back of the subject, the subject will be recorded too dark and the background too light.

The followings are also backlight conditions:
- The subject is indoors and there is a window behind the subject.
- Bright sources such as fluorescent or incandescent lamps are included in the scene.
- A person wearing white or glossy clothes in front of a white background. In this case, the face will be recorded too dark.

For the sharpest pictures, you need the best light

For the most brilliant colour in your scenes, a sufficient light level must be maintained. If shooting is done indoors or under other circumstances where light is insufficient, lights must be used for best results.

What kind of light is best?
Choosing the right lights

Photography lamps or halogen lamps are recommended. For best results, use of the Sony video lights are recommended as their weight and low heat output levels allow safe, direct connection to the camera.
For lighting of a wide area for easy use—
reflector flood light
To emphasize the subject—use a reflector spotlight.

Precautions for using lights

Do not point the light at the recorder body. Instead, make sure that it is pointed parallel to the camera or away from it. Be especially careful with lights attached to the accessory shoe. The high heat from the lights pointed at the camera body can warp the cabinet.

For detailed instructions on proper use of lights, carefully read the instruction manuals that accompany them.

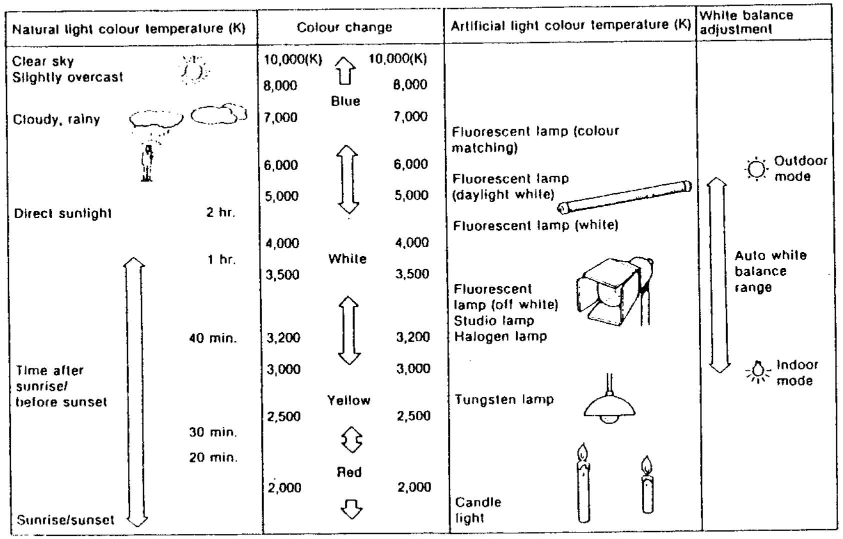
Brightness Levels

The single greatest influence on picture quality is the brightness level. Using the following chart as a reference, take a few minutes to familiarize yourself with brightness levels to improve your recording.

ND filter required	Unit: lux	Snow-covered mountains Snow fields Sandy beach, clear day in summer
Normal recording	100,000	Clear day, mid-day (100,000) Clear day, mid-afternoon (35,000) Overcast day, mid-day (32,000)
	10,000	Overcast day, one hour after sunrise (2,000)
	1,000	Office lit by fluorescent lamps, near window (1,000) Clear day, one hour before sunset (1,000) Department store counter (500 – 700)
	500	Station wicket (650) Office lit by fluorescent lamps (400 – 500) Room lit by two 30 W fluorescent lamps (300)
	300	Subway station platform (300)
Video light recommended	100	Arcade at night (150 – 200)
Video light required	10	Theater lobby (15 – 35) Candle light (10 – 15)

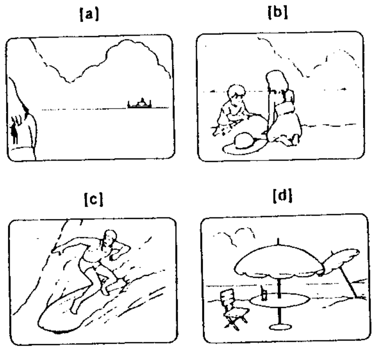
Colour temperature — how it effects white balance adjustment

If the temperature of an object continues to increase, it will eventually begin giving off light. At this time, there is a fixed relationship between the object's temperature and its "light colour." The temperature of the object radiating the light is expressed in absolute temperature (K). This is also known as the colour temperature, which in turn stands for "light colour." As colour temperature increases, the light colour changes from red to yellow to white to blue.



Natural light colour temperature (K)	Colour change			Artificial light colour temperature (K)	White balance adjustment
Clear sky Slightly overcast	10,000(K)	⇧	10,000(K)		
	8,000	Blue	8,000		
Cloudy, rainy	7,000		7,000	Fluorescent lamp (colour matching)	
	6,000	⇕	6,000		Outdoor mode
	5,000		5,000	Fluorescent lamp (daylight white)	⇕
Direct sunlight 2 hr.				Fluorescent lamp (white)	
1 hr.	4,000	White	4,000		Auto white balance range
	3,500		3,500	Fluorescent lamp (off white) Studio lamp Halogen lamp	
40 min.	3,200	⇕	3,200		
Time after sunrise/ before sunset	3,000		3,000		Indoor mode
	2,500	Yellow	2,500	Tungsten lamp	
30 min. 20 min.		⇕ Red			
Sunrise/sunset	2,000	⇩	2,000	Candle light	

C



For More Effective Production

Scene length — not too long, not too short

While there's no hard-and-fast rule, it is generally advisable to make each scene 6 – 7 seconds in length for easier viewing.
A succession of short scenes can tire the viewer, while long, single scenes can become boring.

Cutting according to the narration

Cut the scene when the narration is finished.

Cutting according to the subject C

- Make long shots longer **[a]** ...and close-ups shorter **[b]**.
  Because long shots have more to see in them than colse-ups, show them longer so the viewer may understand what's there.
- Make interesting shots and shots in which the subject is constantly moving longer. **[c]**
- Make static shots shorter **[d]**

Shoot as if you were watching the playback. That is, it's helpful to occasionally imagine your commentary of the scene even as you're shooting it!

In video, organization is the key

To make a first-class production, it is important to decide the contents and shooting sequence in advance. The first step is to sketch out a simple outline of the actual production based on the time-tested "five W's of journalism" (who, what, where, when, why, how). This will allow you to efficiently and effectively record the many exciting events that happen around you, such as sports matches, graduations, birthday parties, picnics, camping trips, and other special events.

When the tape is edited after recording
Shoot the scene a little longer to make the editing easier.

When the tape is not edited after recording
First record a title and then use the START/ STOP function to make a smooth recording.

1-23. USE OF THE BATTERY PACK

There are two kinds of batteries, non-rechargeable ones (primary batteries) such as manganese, alkaline or lithium batteries, and rechargeable ones (secondary batteries) such as nickel-cadmium or lead batteries.
The NP-55/77 battery pack used for this unit is a rechargeable type. When a rechargeable battery is used under proper conditions, the power capacity remains stable for a long period.

Battery Life

For every hour's worth of tape you shoot, plan to use 2 to 3 hour's worth of battery power.

The NP-55 provides approximately 40 minutes operation.
The NP-77 provides approximately 80 minutes operation.

The above battery life shows when the fully-charged battery is used for continuous recording in the normal temperature.
The following cases cause the battery to wear.

- In the recording pause mode (standby)
- When the auto focusing operates
- When the power zooming operates
- When the cassette is inserted or removed

Ambient temperature

If the battery pack is used in a cold environment, its operating time is shortened.

- A chemical change occurs inside the battery when generating electrical energy. When the ambient temperature is high, the chemical change is stronger and the battery life is extended.
- Manganese and alkaline batteries are affected more than nickel-cadmium batteries by ambient temperature.
  Therefore the EBP-55 battery case cannot be used in a cold environment.

Charging and Discharging

To use the battery pack for a long time, charge the battery pack fully and discharge it.

Charging

- The battery pack can be charged within a temperature range of 0°C to 40°C (32°F to 104°F). However, it is hard to charge the battery pack in a cold place. We recommend undertaking charging operations within a temperature range of 10°C to 30°C (50°F to 86°F).
- The battery pack was not charged at the factory. So before using the battery pack, please charge it.
- Before using the battery which has not been used for a long time (about 1 year), charge the battery fully. In this case the batterylife is shorten.
  After several charging and discharging operations, the battery life will recover its original status.
- The battery pack may be warm after use or after charging, but this is normal. This is due to the chemical change that has occurred inside the battery.

Discharging

- After using the recorder, remove the cassette and set the POWER switch to CAMERA and slide up the STANDBY switch, and leave the recorder until the battery pack is fully discharged.
- If recharging is repeated before the battery is exhausted, the battery life will be shortened.
  If the battery life has been shortened due to this, charge and discharge it to recover the original battery capacity.
- Please use the battery pack until the 🔋 mark blinks.
- To discharge, the battery pack as completely as possible, use an optional video light.
  If the video light become dark, remove it from the video camera recorder.

Storage

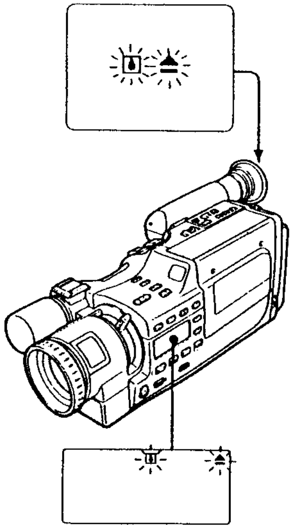
- When the video camera recorder is not in use, discharge the battery pack completely, remove and store it in a cold place. When the battery pack is installed, even if the power is turned off, a very small amount of electric current flows.
- Even when the battery pack is not in use, it discharges. This is called self-discharge.
  Self-discharge of the nickel-cadmium battery is more than that of the manganese or alkaline battery.
  The capacity decreases about 20% in one month and 30% in two months.
  After the battery is stored in a hot place, the capacity is lowered due to self-discharge.

Battery life
The battery pack can be used about 500 times in normal temperature, if it is charged fully and discharged and stored in a cold place when not in use.

The battery pack can be used until the capacity becomes less than 50% and cannot be recharged.
Even when a fully charged battery is used, if the 🔋 mark blinks, use a new battery pack.

1-24. NOTES ON MOISTURE CONDENSATION

D-1



If the unit is brought directly from a cold to a warm location, moisture may condense inside the unit, on the surface or the tape or on the lens. In this condition, the tape may adhere to the head drum and be damaged or the unit may not operate correctly. To prevent possible damage under these circumstances, the unit is furnished with moisture sensors.

Moisture is present inside the unit when: D-1

The ▣ and ⏏ indication blinks inside the viewfinder or in the display window.
No function except for cassette ejection will work.

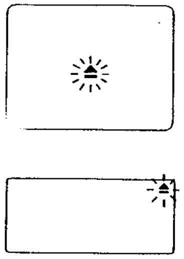
▽

Eject the cassette if present, and turn off the unit and leave it with the cassette holder open at least for one hour.

▽

The unit can be used again if the ▣ and ⏏ indication does not appear when the power is turned on again.

D-2



If moisture is present on the surface of the tape D-2

When the tape is inserted and a tape transport button is pressed, the ⏏ indication blinks inside the viewfiner or in the display window. No function except for cassette ejection will work.

▽

Eject the cassette and let the unit and the cassette sit at least for one hour.
The cassette can be used again if the ⏏ indication does not appear when the cassette is inserted and a tape transport button is pressed.

If moisture condensation occurs on the lens
There are no caution indications, but the lens becomes dim. Turn off the power and leave the unit unused at least for one hour.

1-25. PRECAUTIONS

Operation

- Operate the unit on 6.0V (using battery pack), 7.5V (using AC power adaptor), or 9.0V (using alkaline batteries) DC.
- For DC or AC operation, use the accessories recommended in this manual.
- Should any solid object or liquid fall into the cabinet, unplug the unit and have it checked by qualified personnel before operating it any further.
- Do not hold the unit by the viewfinder.
- Avoid rough handling or mechanical shock to the unit. Be particularly careful of the lens.
- Do not apply excessive force to the microphone.
- Avoid shooting the same object for a long period of time (for example, using as a lookout camera or poiinting the camera directly at the sun or other bright light sources) as this will damage the color filter inside the camera and may cause a poor picture quality.
- Remove and store video cassettes after recording or playback.
- Do not wrap up thhe unit and operate it because heat may build up internally.
- Avoid using and storing the recorder in the following locations.
  — Locations susceptible to vibration.
  — Locations exposed to strong magnetic fields.
  — Locations near TV or radio transmitters where strong radio waves are generated.
- Do not put the unit on the sand.

Care

- Store cassettes in their cases and keep them in an upright position to prevent intrusion of dust and uneven winding.
- When the unit will not be used for a long period of time, periodically turn on the power, operate the camera section and recorder section and play back a tape for about three minutes.
- Clean the lens with a soft brush to remove dust. If theere are fingerprints on them, remove them with a soft cloth. Clean the recorder body with a dry, soft cloth, or a soft cloth lightly moistened with a mild detergent solution. Do not use any type of solvent which may damage the finish.
  For protection, keep the lens cap on the lens when not using the camera.

1-26. USING YOUR RECORDER ABROAD

Each country has special TV colour broadcast and electricity systems. Before using your recorder abroad, check the following points.

Differences in colour systems
If you prepare fully charged battery packs and the AC power adaptor which can be used in all areas with the local power supply of 100V–240V, you can use your recorder in any country. You can monitor the playback picture on the viewfinder screen. However, to monitor the playback picture on a TV, the TV must be based on the PAL system and have the video/audio inputs.

PAL system countries
Australia, Austria, Bellgium, China, Denmark, Finland, Great Britain, Holland, Hong Kong, Italy, Kuwait, New Zealand, Norway, Portugal, Singapore, Spain, Sweden, Switzerland, Thailand, West Germany, etc.

NTSC system countries
Bahama Islands, Canada, Central America, Japan, Korea, Mexico, Taiwan, the Phillipines, U.S.A., etc.

SECAM system countries
Bulgaria, France, Hungary, Iran, Iraq, Luxemburg, Monaco, Poland, the Soviet Union, etc.

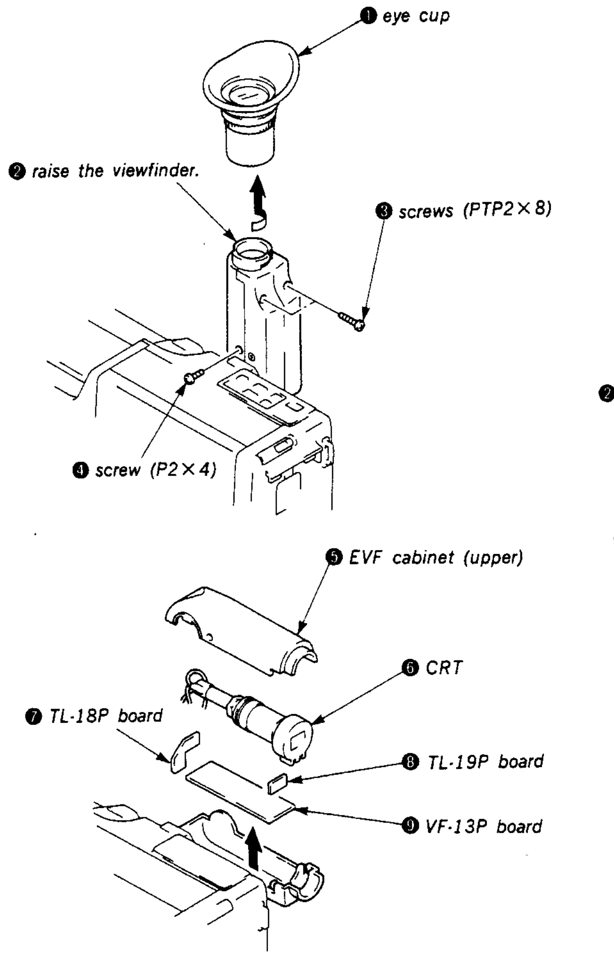
Cassettes and Their Recording Time

There are two formats for 8 mm video recording, PAL and NTSC. Video cassette tapes are made to correspond to the respective formats. Use PAL format cassette tape for the CCD-F500E. You will find "P5" on the package of the cassette. In some countries, however, only NTSC format cassette tape with "P6" on the package is available. In this case, the standard recording times stipulated on the cassette are different from the actual recording time.
For your reference, the recording times PAL and NTSC format cassettes are as follows:

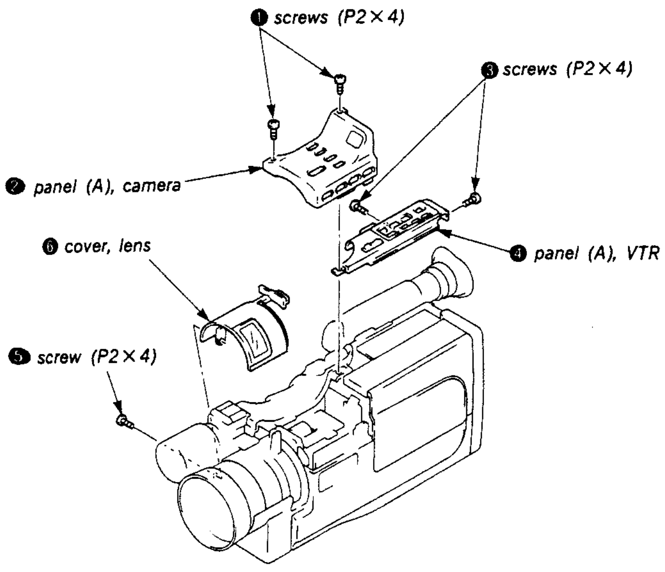
PAL cassette			**NTSC cassette**		
	Recording time			Recording time	
Cassette	SP mode	LP mode	Cassette	SP mode	LP mode
P5-15	15 min.	30 min.	P6-15	10 min.	20 min.
P5-30	30 min.	60 min.	P6-30	21 min.	42 min.
P5-60	60 min.	120 min.	P6-60	42 min.	84 min.
P5-90	90 min.	180 min.	P6-90	64 min.	128 min.
			P6-120	85 min.	170 min.

SECTION 2
DISASSEMBLY

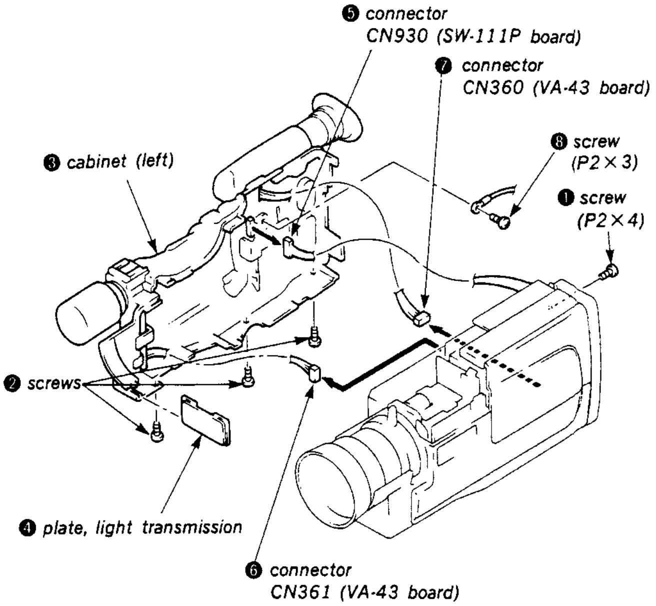
2-1. REMOVAL OF VIEWFINDER


❶ eye cup
❷ raise the viewfinder.
❸ screws (PTP2×8)
❹ screw (P2×4)
❺ EVF cabinet (upper)
❻ CRT
❼ TL-18P board
❽ TL-19P board
❾ VF-13P board

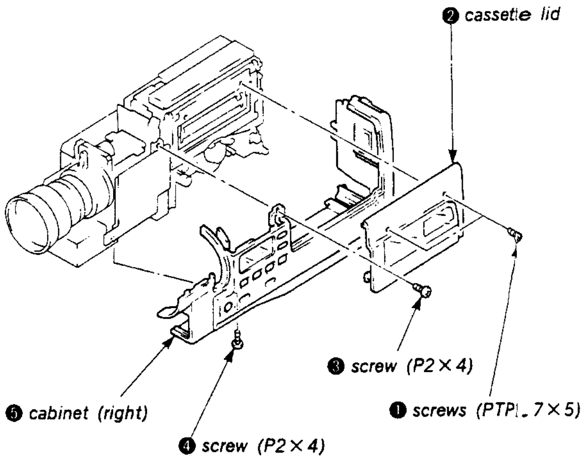
2-2. REMOVAL OF CABINET (1)


❶ screws (P2×4)
❸ screws (P2×4)
❷ panel (A), camera
❹ panel (A), VTR
❻ cover, lens
❺ screw (P2×4)

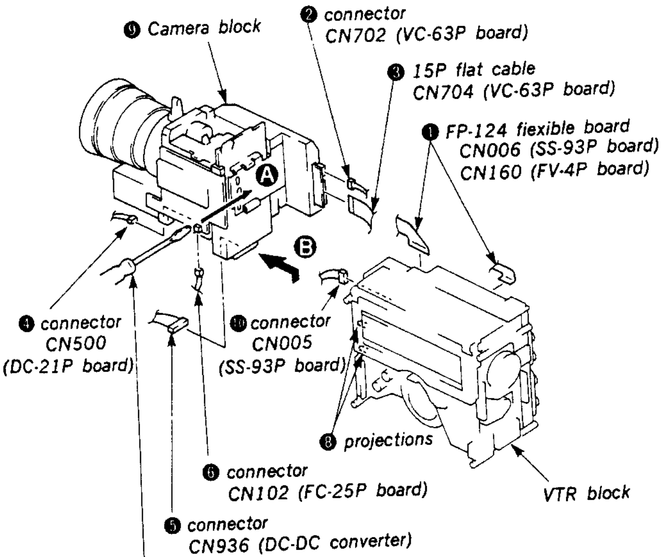
2-3. REMOVAL OF CABINET (2)
— CABINET (LEFT) —


❺ connector
CN930 (SW-111P board)
❼ connector
CN360 (VA-43 board)
❸ cabinet (left)
❽ screw
(P2×3)
❶ screw
(P2×4)
❷ screws
❹ plate, light transmission
❻ connector
CN361 (VA-43 board)

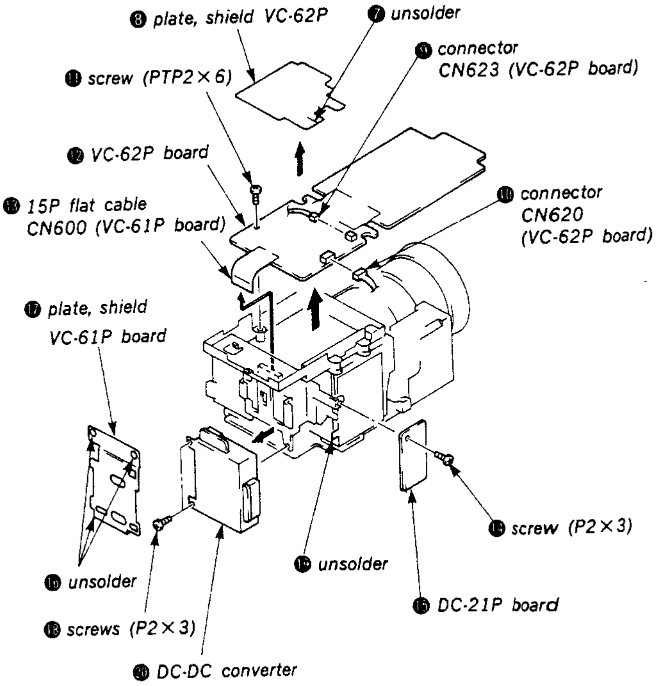
2-4. REMOVAL OF CABINET (3)
— CABINET (RIGHT) —


❷ cassette lid
❸ screw (P2×4)
❺ cabinet (right)
❶ screws (PTP1.7×5)
❹ screw (P2×4)

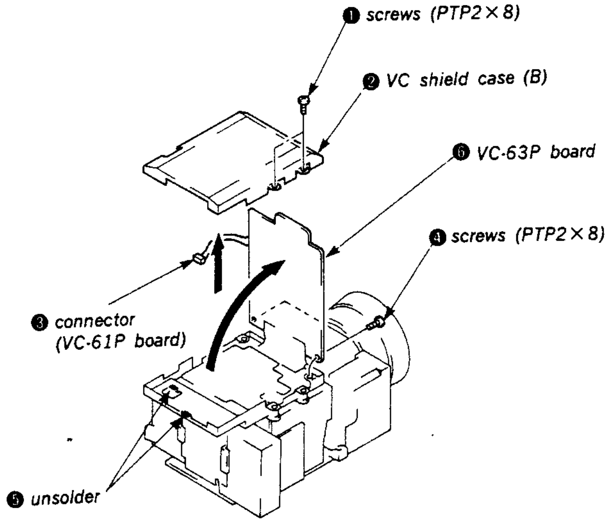
2-5. SEPARATING THE CAMERA AND VTR BLOCKS

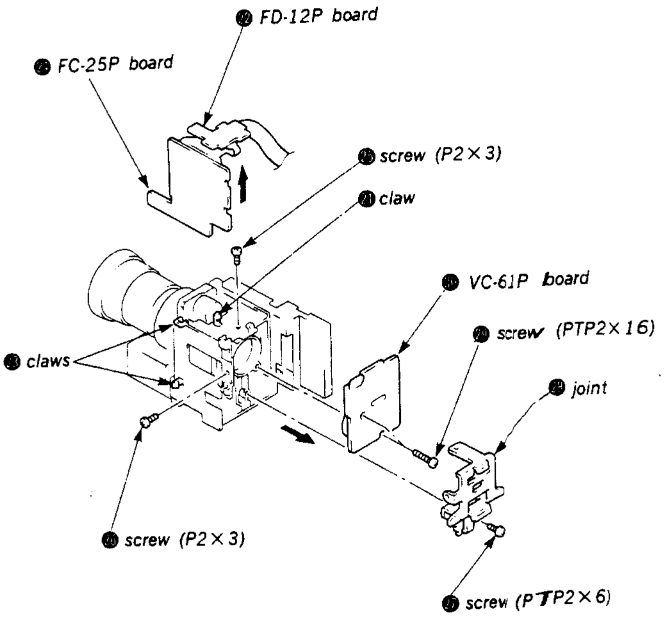

⑨ Camera block
② connector
CN702 (VC-63P board)
③ 15P flat cable
CN704 (VC-63P board)
① FP-124 flexible board
CN006 (SS-93P board)
CN160 (FV-4P board)
Ⓐ
Ⓑ
④ connector
CN500
(DC-21P board)
⑩ connector
CN005
(SS-93P board)
⑧ projections
⑥ connector
CN102 (FC-25P board)
VTR block
⑤ connector
CN936 (DC-DC converter)

⑦ Insert a flat-bladed screwdriver between the camera block and VTR block (as shown by arrow Ⓐ) to separate two projections. Then slightly lift and remove the camera block ⑨ in the direction shown by the arrow Ⓑ.


⑧ plate, shield VC-62P
⑦ unsolder
⑪ screw (PTP2×6)
⑨ connector
CN623 (VC-62P board)
⑫ VC-62P board
⑬ 15P flat cable
CN600 (VC-61P board)
⑩ connector
CN620
(VC-62P board)
⑰ plate, shield
VC-61P board
⑭ screw (P2×3)
⑲ unsolder
⑯ unsolder
⑮ DC-21P board
⑱ screws (P2×3)
⑳ DC-DC converter

2-6. REMOVAL OF VC-61P (CCD IMAGER), VC-62P AND VC-63P BOARDS

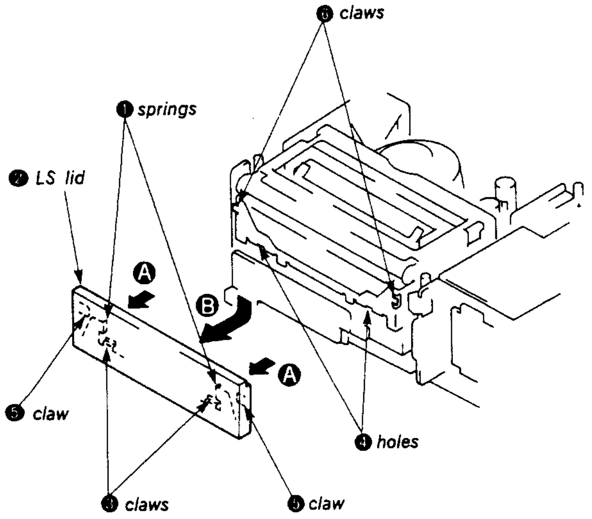

① screws (PTP2×8)
② VC shield case (B)
⑥ VC-63P board
④ screws (PTP2×8)
③ connector
(VC-61P board)
⑤ unsolder


㉒ FD-12P board
㉓ FC-25P board
㉕ screw (P2×3)
㉑ claw
㉚ VC-61P board
㉘ claws
㉙ screw (PTP2×16)
㉙ joint
⑳ screw (P2×3)
㉗ screw (PTP2×6)

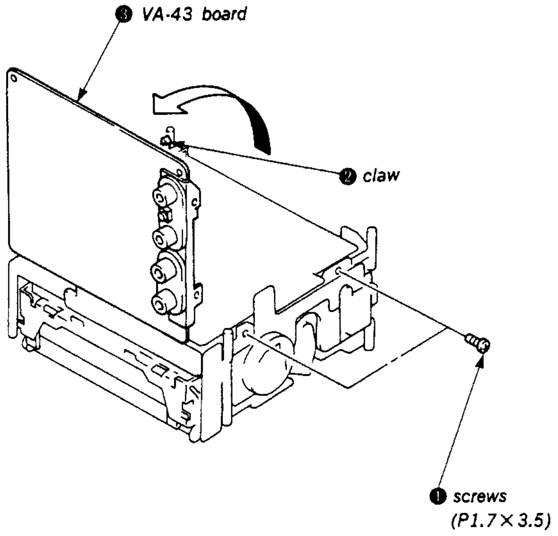
2-7. REMOVAL OF LS LID

1) Insert a thin flat-bladed screwdriver into the spring ❶ at 2 points and push it in the direction of arrow Ⓐ, and then remove the LS lid ❷ in the direction of arrow Ⓑ.

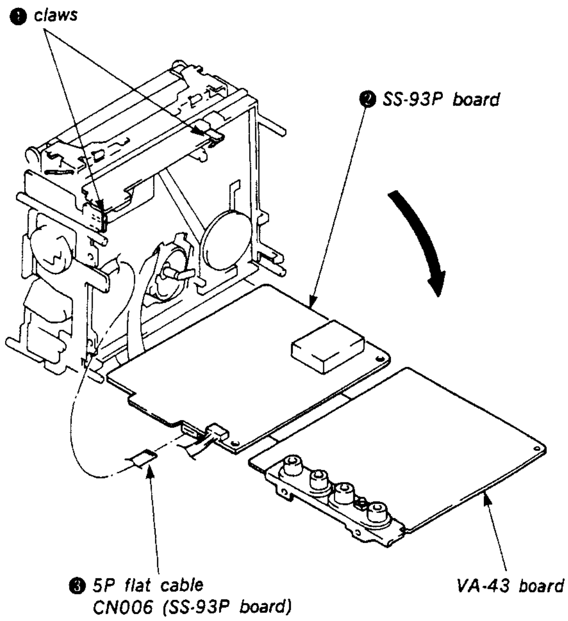
Note : To re-assemble, locate the two claws ❸ at the back of each hole ❹ at 2 points, and also the two claws ❺ at the back of each claw ❻ at 2 locations.


❻ claws
❶ springs
❷ LS lid
Ⓐ
Ⓑ
Ⓐ
❺ claw
❹ holes
❸ claws
❺ claw

2-8. OPENING THE VA-43 BOARD

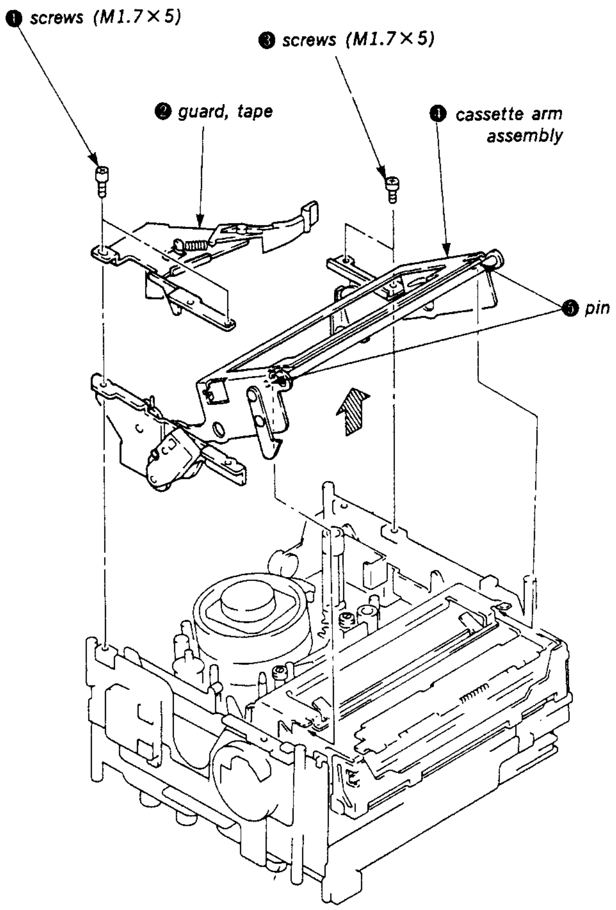

❸ VA-43 board
❷ claw
❶ screws
(P1.7×3.5)

2-9. OPENING THE SS-93P BOARD

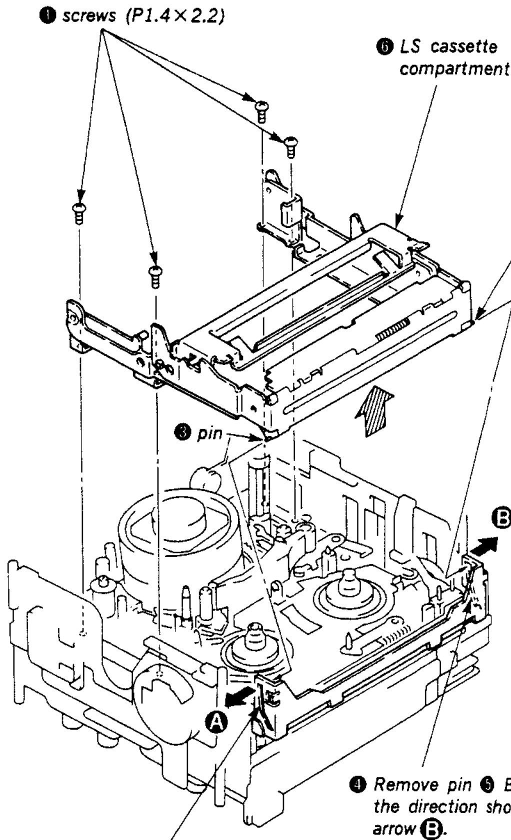

❶ claws
❷ SS-93P board
❸ 5P flat cable
CN006 (SS-93P board)
VA-43 board

2-10. REMOVAL OF CASSETTE ARM ASSEMBLY

Note :
To re- assembly the cassette arm assembly ❹, adjust it so that pin ❺ can be inserted in the correct position.


❶ screws (M1.7×5)
❸ screws (M1.7×5)
❷ guard, tape
❹ cassette arm assembly
❺ pin

2-11. REMOVAL OF LS CASSETTE COMPARTMENT ASSEMBLY

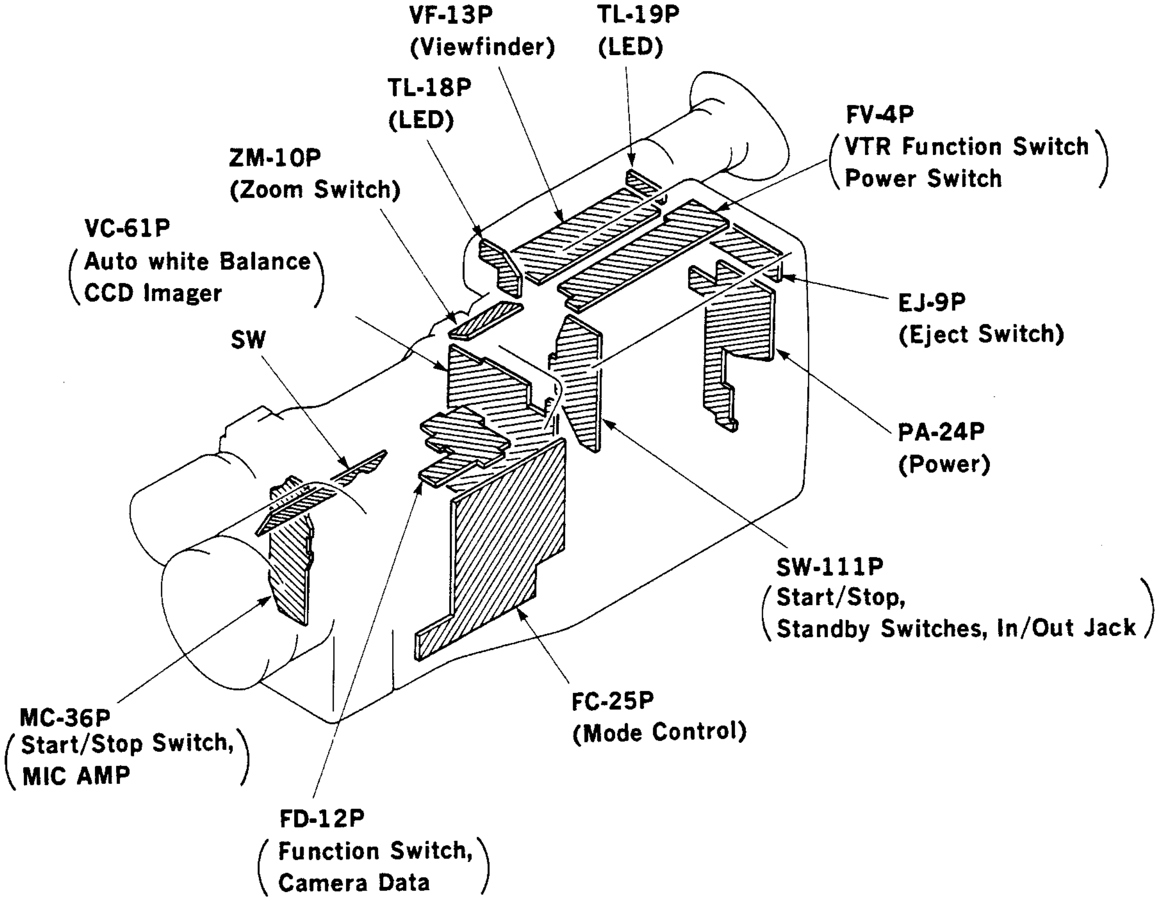

❶ screws (P1.4×2.2)
❻ LS cassette compartment assembly
❺ pin
❸ pin
Ⓑ
Ⓐ

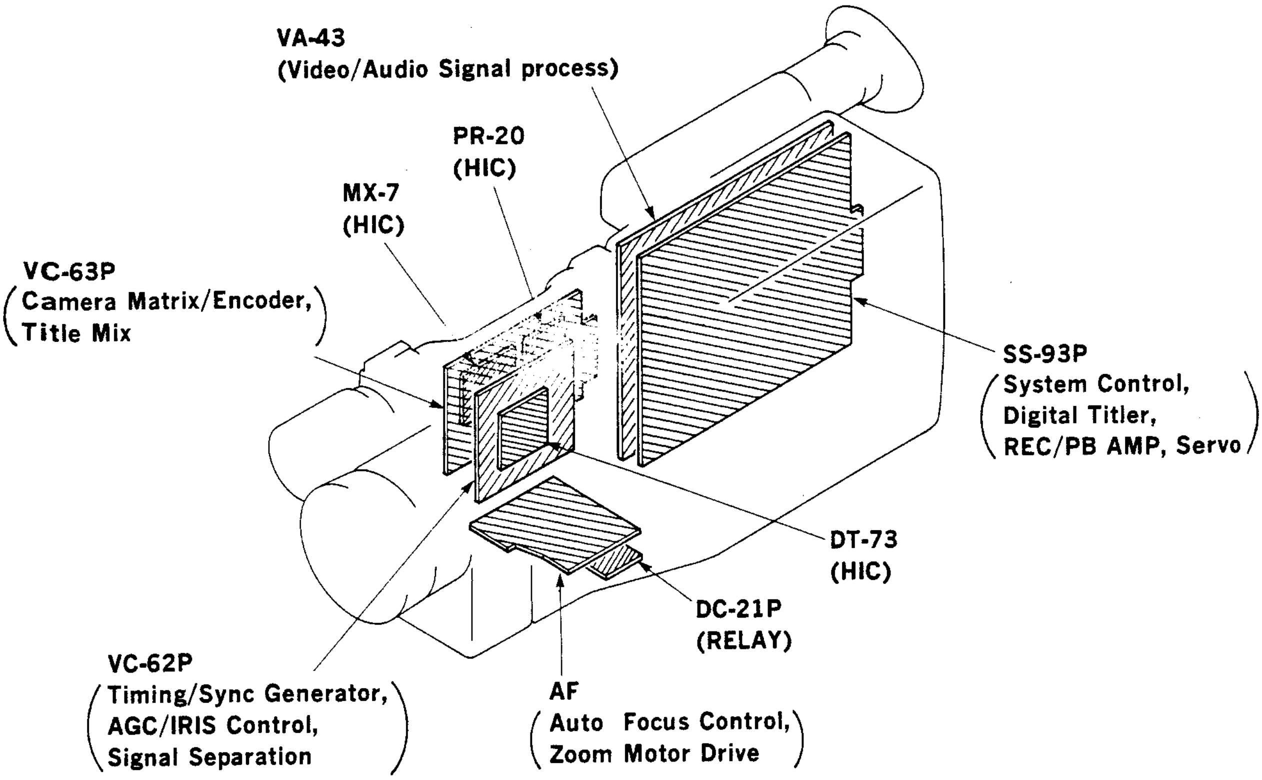
❹ Remove pin ❺ By pushing it in the direction shown by the arrow Ⓑ.

❷ Remove pin ❸ in the direction shown by the arrow Ⓐ.

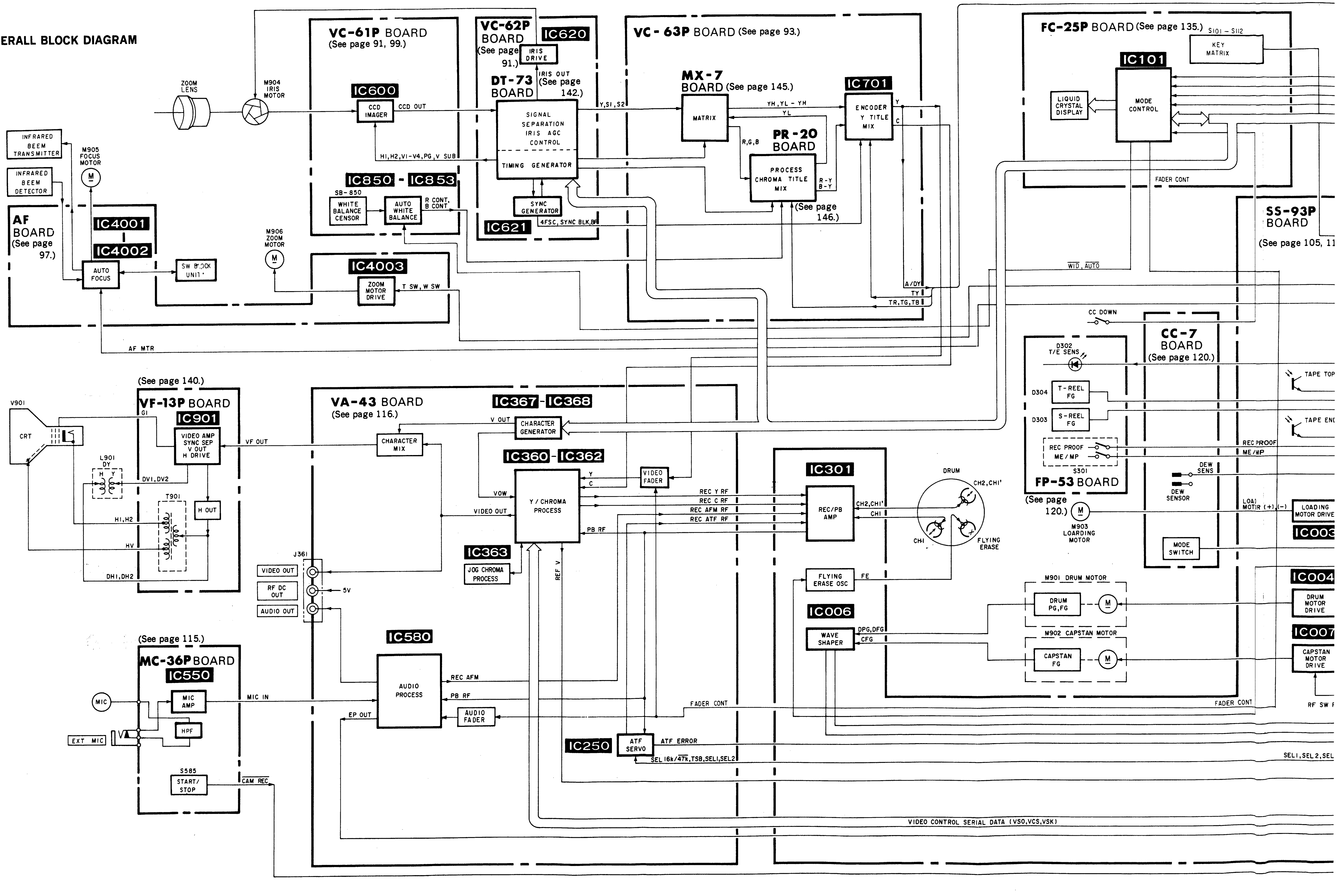
SECTION 3
DIAGRAMS

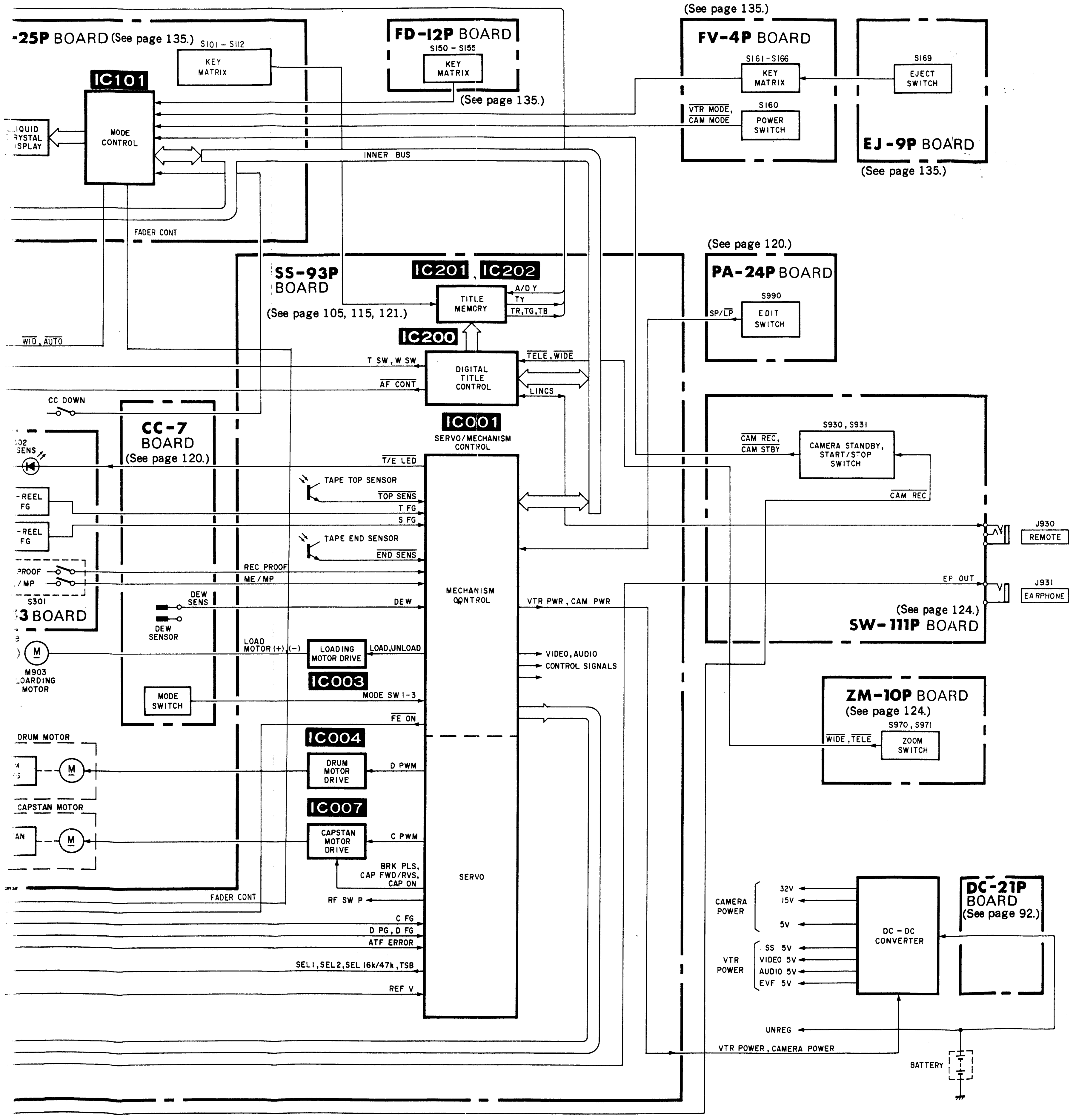
3-1. CIRCUIT BOARDS LOCATION


VF-13P (Viewfinder)
TL-19P (LED)
TL-18P (LED)
FV-4P (VTR Function Switch Power Switch)
ZM-10P (Zoom Switch)
VC-61P (Auto white Balance CCD Imager)
SW
EJ-9P (Eject Switch)
PA-24P (Power)
SW-111P (Start/Stop, Standby Switches, In/Out Jack)
FC-25P (Mode Control)
MC-36P (Start/Stop Switch, MIC AMP)
FD-12P (Function Switch, Camera Data)

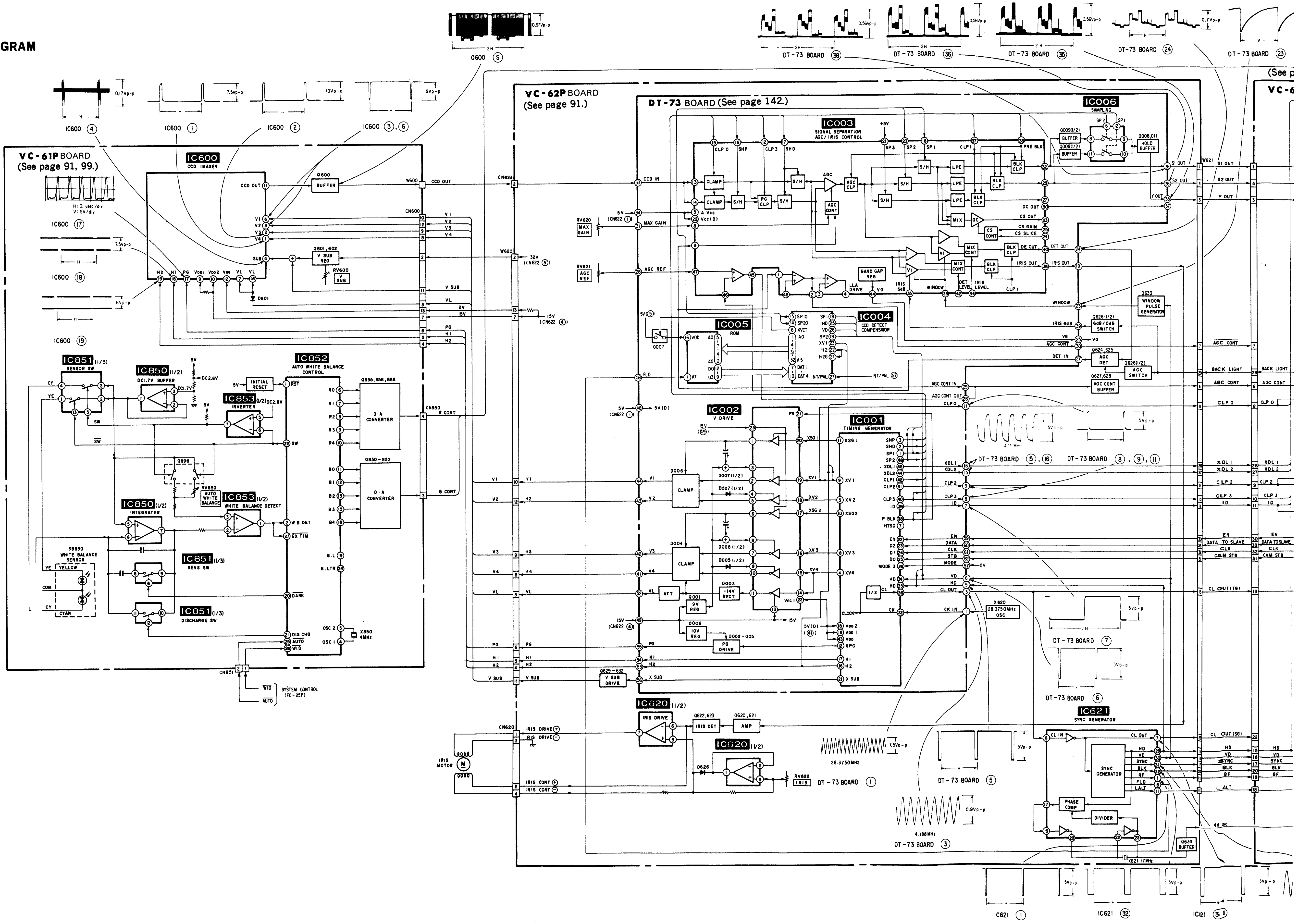

VA-43 (Video/Audio Signal process)
PR-20 (HIC)
MX-7 (HIC)
VC-63P (Camera Matrix/Encoder, Title Mix)
SS-93P (System Control, Digital Titler, REC/PB AMP, Servo)
DT-73 (HIC)
DC-21P (RELAY)
VC-62P (Timing/Sync Generator, AGC/IRIS Control, Signal Separation)
AF (Auto Focus Control, Zoom Motor Drive)

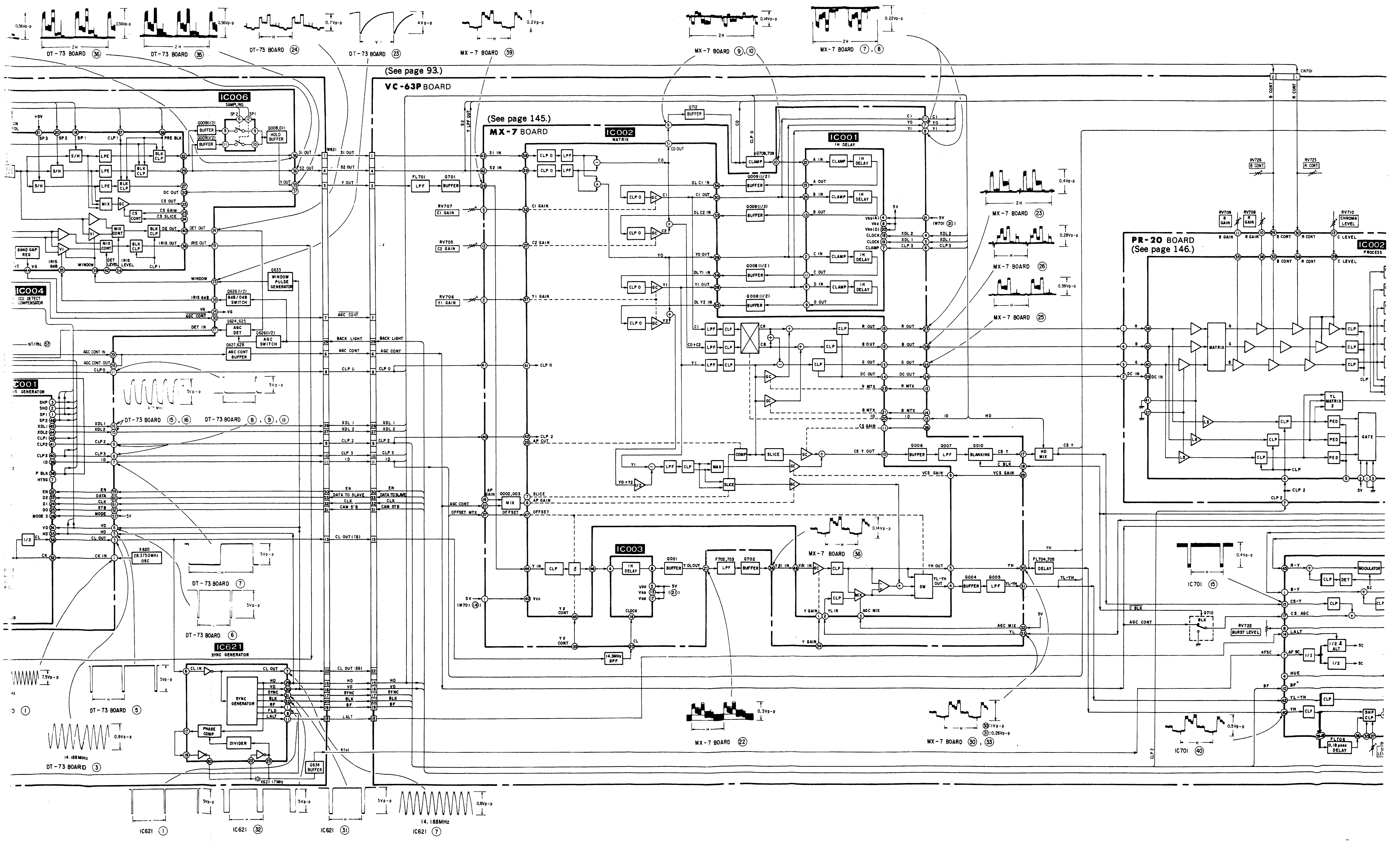
3-2. OVERALL BLOCK DIAGRAM

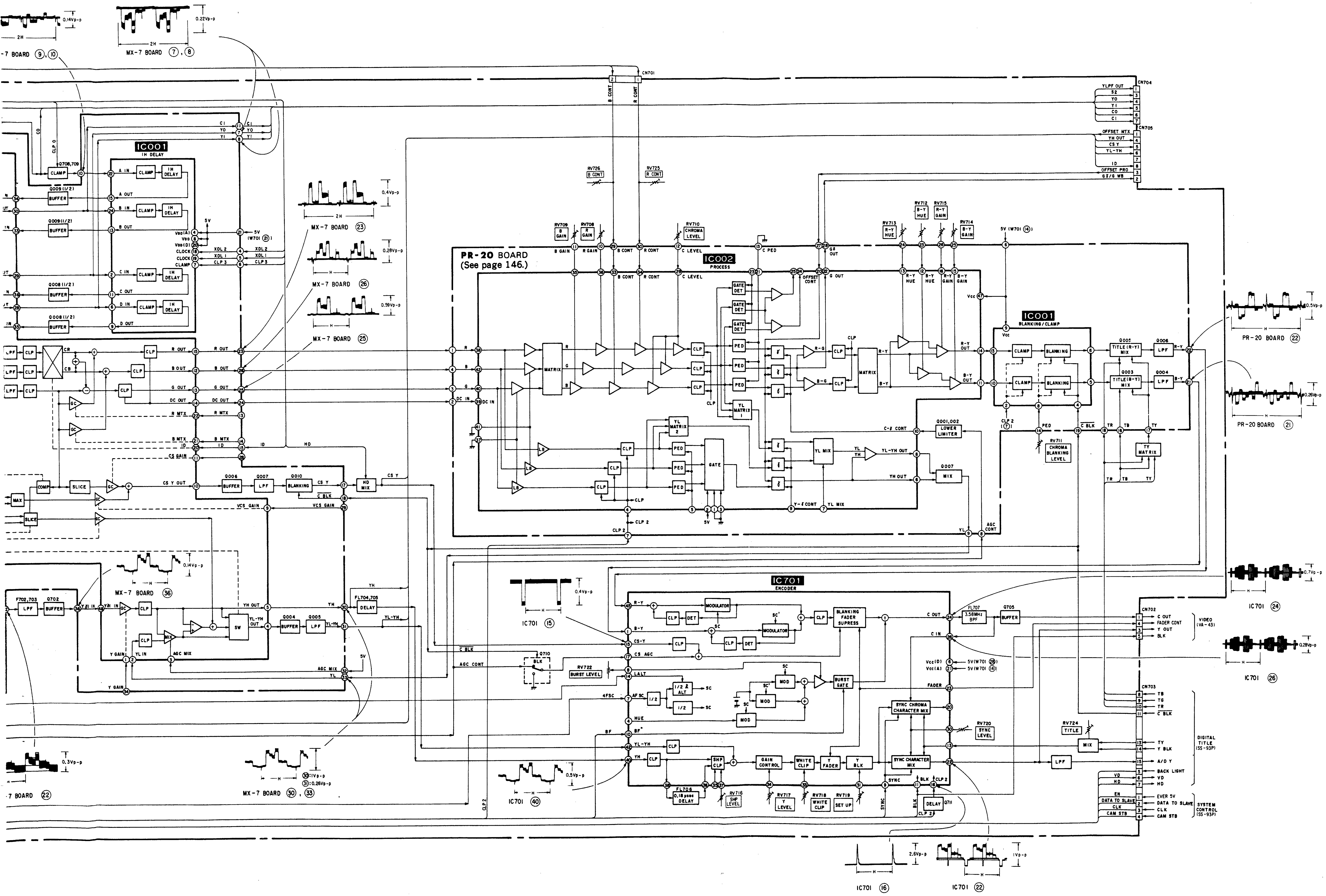

ZOOM LENS
M904 IRIS MOTOR
M905 FOCUS MOTOR
M906 ZOOM MOTOR
INFRARED BEEM TRANSMITTER
INFRARED BEEM DETECTOR
AF BOARD (See page 97.)
IC4001 - IC4002
AUTO FOCUS
SW BLOCK UNIT
AF MTR
VC-61P BOARD (See page 91, 99.)
IC600
CCD IMAGER
CCD OUT
H1,H2,V1-V4,PG,V SUB
IC850 - IC853
SB-850
WHITE BALANCE CENSOR
AUTO WHITE BALANCE
R CONT, B CONT
IC4003
ZOOM MOTOR DRIVE
T SW, W SW
VC-62P BOARD (See page 91.)
IC620
IRIS DRIVE
IRIS OUT
DT-73 BOARD (See page 142.)
SIGNAL SEPARATION IRIS AGC CONTROL
TIMING GENERATOR
SYNC GENERATOR
IC621
4FSC, SYNC BLK,BF
Y,S1,S2
VC-63P BOARD (See page 93.)
MX-7 BOARD (See page 145.)
MATRIX
YH,YL - YH
YL
R,G,B
PR-20 BOARD (See page 146.)
PROCESS CHROMA TITLE MIX
R-Y
B-Y
IC701
ENCODER Y TITLE MIX
Y
C
A/DY
TY
TR,TG,TB
FC-25P BOARD (See page 135.)
S101 - S112
KEY MATRIX
IC101
LIQUID CRYSTAL DISPLAY
MODE CONTROL
FADER CONT
WID, AUTO
SS-93P BOARD
(See page 105, 11
CC DOWN
D302 T/E SENS
D304
T-REEL FG
D303
S-REEL FG
REC PROOF
ME/MP
S301
FP-53 BOARD (See page 120.)
M903 LOARDING MOTOR
CC-7 BOARD (See page 120.)
DEW SENS
DEW SENSOR
MODE SWITCH
TAPE TOP
TAPE END
REC PROOF
ME/MP
LOADING MOTOR (+),(-)
LOADING MOTOR DRIVE
IC003
IC004
DRUM MOTOR DRIVE
IC007
CAPSTAN MOTOR DRIVE
RF SW
V901
CRT
(See page 140.)
VF-13P BOARD
IC901
G1
VIDEO AMP SYNC SEP V OUT H DRIVE
VF OUT
L901 DY
H
V
DV1,DV2
T901
H OUT
H1,H2
HV
DH1,DH2
VA-43 BOARD (See page 116.)
CHARACTER MIX
IC367 - IC368
V OUT
CHARACTER GENERATOR
IC360 - IC362
VOW
VIDEO OUT
Y/CHROMA PROCESS
Y
C
VIDEO FADER
REC Y RF
REC C RF
REC AFM RF
REC ATF RF
PB RF
REF V
IC363
JOG CHROMA PROCESS
J361
VIDEO OUT
RF DC OUT
AUDIO OUT
5V
IC580
AUDIO PROCESS
REC AFM
PB RF
AUDIO FADER
EP OUT
FADER CONT
IC250
ATF SERVO
ATF ERROR
SEL 16k/47k,TSB,SEL1,SEL2
IC301
REC/PB AMP
CH2,CH1'
CH1
DRUM
CH2,CH1'
CH1
FLYING ERASE
FLYING ERASE OSC
FE
IC006
WAVE SHAPER
DPG,DFG
CFG
M901 DRUM MOTOR
DRUM PG,FG
M
M902 CAPSTAN MOTOR
CAPSTAN FG
FADER CONT
SEL1,SEL2,SEL
(See page 115.)
MC-36P BOARD
IC550
MIC
MIC AMP
MIC IN
HPF
EXT MIC
S585
START/STOP
CAM REC
VIDEO CONTROL SERIAL DATA (VSO,VCS,VSK)


-25P BOARD (See page 135.)
S101 – S112
KEY MATRIX
IC101
MODE CONTROL
LIQUID CRYSTAL DISPLAY
INNER BUS
FADER CONT
FD-12P BOARD
S150 – S155
KEY MATRIX
(See page 135.)
(See page 135.)
FV-4P BOARD
S161 – S166
KEY MATRIX
VTR MODE, CAM MODE
S160
POWER SWITCH
S169
EJECT SWITCH
EJ-9P BOARD
(See page 135.)
SS-93P BOARD
(See page 105, 115, 121.)
IC201, IC202
TITLE MEMORY
A/D Y
TY
TR,TG,TB
IC200
DIGITAL TITLE CONTROL
T SW, W SW
AF CONT
TELE, WIDE
LINCS
WID, AUTO
CC DOWN
CC-7 BOARD
(See page 120.)
IC001
SERVO/MECHANISM CONTROL
T/E LED
SENS
TAPE TOP SENSOR
TOP SENS
T FG
S FG
REEL FG
REEL FG
TAPE END SENSOR
END SENS
REC PROOF
ME / MP
PROOF
/MP
S301
3 BOARD
DEW SENS
DEW
DEW SENSOR
MECHANISM CONTROL
VTR PWR, CAM PWR
LOAD MOTOR (+), (–)
LOADING MOTOR DRIVE
LOAD, UNLOAD
IC003
M903 LOADING MOTOR
M
VIDEO, AUDIO CONTROL SIGNALS
MODE SWITCH
MODE SW 1–3
FE ON
IC004
DRUM MOTOR
DRUM MOTOR DRIVE
D PWM
IC007
CAPSTAN MOTOR
CAPSTAN MOTOR DRIVE
C PWM
BRK PLS, CAP FWD/RVS, CAP ON
SERVO
FADER CONT
RF SW P
C FG
D PG, D FG
ATF ERROR
SEL1, SEL2, SEL 16k/47k, TSB
REF V
(See page 120.)
PA-24P BOARD
S990
SP/LP
EDIT SWITCH
S930, S931
CAM REC, CAM STBY
CAMERA STANDBY, START/STOP SWITCH
CAM REC
J930
REMOTE
EF OUT
J931
EARPHONE
(See page 124.)
SW-111P BOARD
ZM-10P BOARD
(See page 124.)
S970, S971
WIDE, TELE
ZOOM SWITCH
CAMERA POWER
32V
15V
5V
VTR POWER
SS 5V
VIDEO 5V
AUDIO 5V
EVF 5V
DC – DC CONVERTER
DC-21P BOARD
(See page 92.)
UNREG
VTR POWER, CAMERA POWER
BATTERY

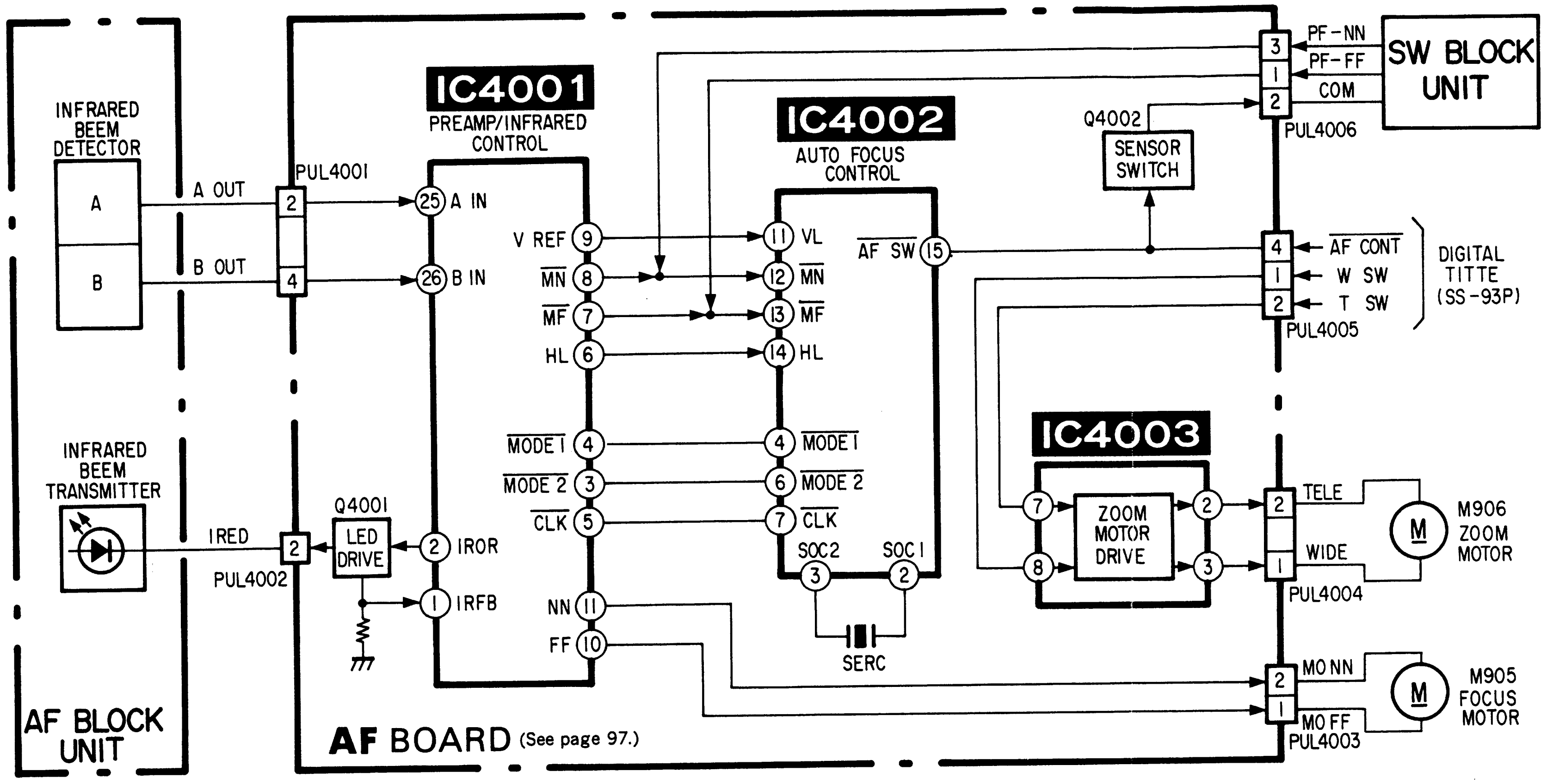
3-3. CAMERA BLOCK DIAGRAM


VC-61P BOARD
(See page 91, 99.)
VC-62P BOARD
(See page 91.)
DT-73 BOARD (See page 142.)
IC600
CCD IMAGER
Q600
BUFFER
Q601, 602
V SUB REG
RV600
V SUB
D601
IC851 (1/3)
SENSOR SW
IC850 (1/2)
DC1.7V BUFFER
IC853 (1/2)
INVERTER
INITIAL RESET
IC852
AUTO WHITE BALANCE CONTROL
Q855, 856, 868
D-A CONVERTER
Q850-852
D-A CONVERTER
Q896
RV850
AUTO WHITE BALANCE
IC853 (1/2)
WHITE BALANCE DETECT
IC850 (1/2)
INTEGRATOR
SB850
WHITE BALANCE SENSOR
YELLOW
CYAN
IC851 (1/3)
SENS SW
IC851 (1/3)
DISCHARGE SW
X850
4MHz
CN851
SYSTEM CONTROL
(FC-25P)
WID
AUTO
CCD OUT
R CONT
B CONT
RV620
MAX GAIN
RV621
AGC REF
IC003
SIGNAL SEPARATION
AGC/IRIS CONTROL
CLAMP
S/H
PG CLP
AGC
AGC CLP
AGC CONT
LPE
BLK CLP
MIX
CS CONT
DET LEVEL
IRIS LEVEL
WINDOW
BAND GAP REG
LLA DRIVE
IC006
SAMPLING
Q009(1/2)
BUFFER
Q008, 011
HOLD BUFFER
S1 OUT
S2 OUT
Y OUT
Q633
WINDOW PULSE GENERATOR
Q626(1/2)
6dB/0dB SWITCH
Q624, 625
AGC DET
Q626(1/2)
AGC SWITCH
Q627, 628
AGC CONT BUFFER
IC005
ROM
Q007
IC004
CCD DETECT COMPENSATOR
IC002
V DRIVE
D006
CLAMP
D004
CLAMP
D007 (1/2)
D005 (1/2)
ATT
Q001
9V REG
D003
-14V RECT
Q006
10V REG
Q002-005
PG DRIVE
Q629-632
V SUB DRIVE
IC001
TIMING GENERATOR
X620
28.3750MHz
OSC
1/2
IC620 (1/2)
IRIS DRIVE
Q622, 623
IRIS DET
Q620, 621
AMP
IC620 (1/2)
D626
RV622
IRIS
IRIS MOTOR
IC621
SYNC GENERATOR
SYNC GENERATOR
PHASE COMP
DIVIDER
Q634
BUFFER
X621 17MHz
28.3750MHz
14.188MHz
DT-73 BOARD ①
DT-73 BOARD ③
DT-73 BOARD ⑤
DT-73 BOARD ⑥
DT-73 BOARD ⑦
DT-73 BOARD ⑧, ⑨, ⑪
DT-73 BOARD ⑮, ⑯
DT-73 BOARD ㉓
DT-73 BOARD ㉔
DT-73 BOARD ㉟
DT-73 BOARD ㊱
DT-73 BOARD ㊳
Q600 ⓢ
IC600 ①
IC600 ②
IC600 ③, ⑥
IC600 ④
IC600 ⑰
IC600 ⑱
IC600 ⑲
IC621 ①
IC621 ㉜
IC621 ㉛
0.17Vp-p
7.5Vp-p
10Vp-p
9Vp-p
6Vp-p
0.67Vp-p
0.56Vp-p
0.7Vp-p
5Vp-p
0.9Vp-p
H: 0.1μsec/div
V: 5V/div

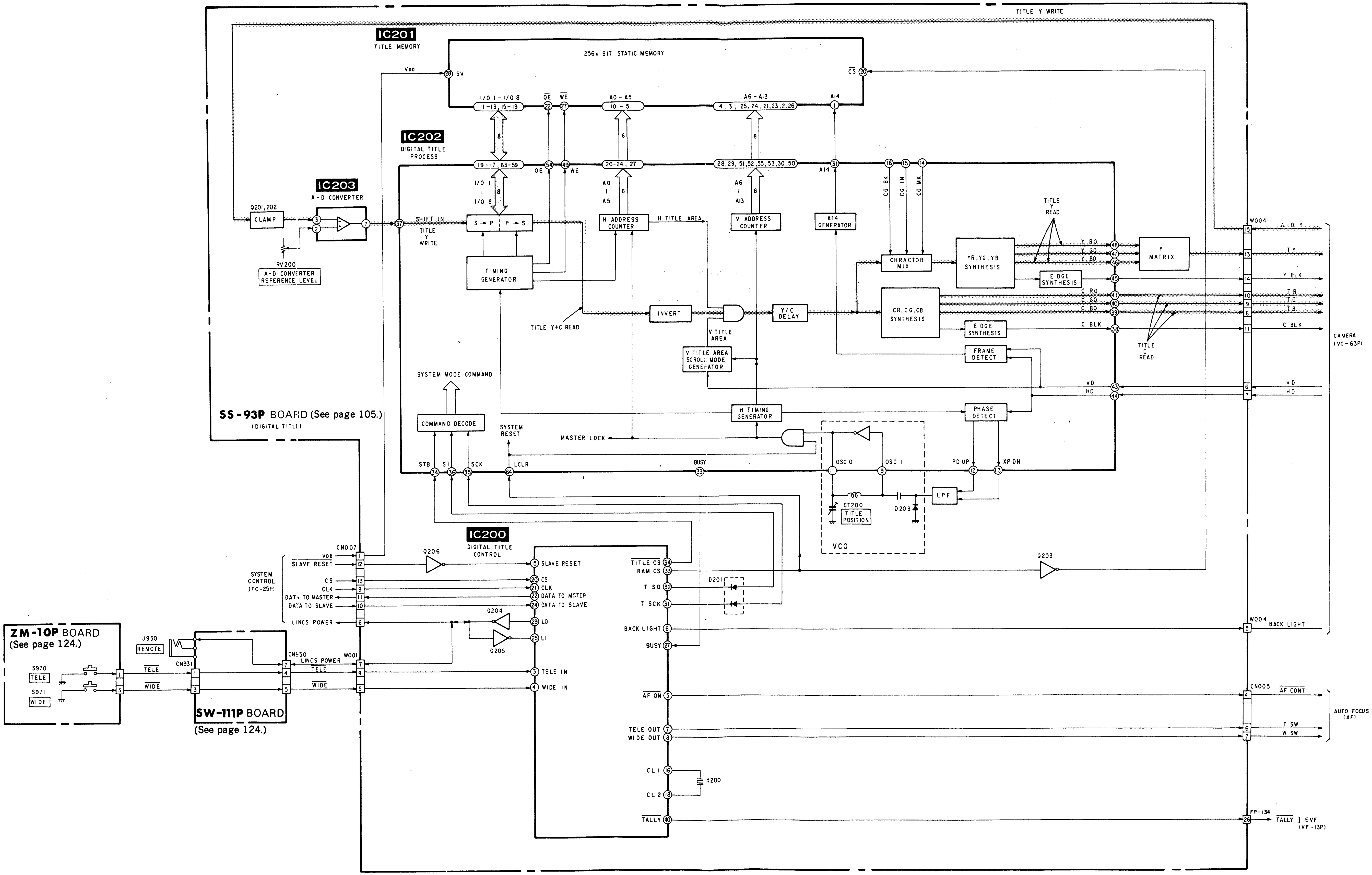

DT-73 BOARD ㊱
DT-73 BOARD ㉟
DT-73 BOARD ㉔
DT-73 BOARD ㉓
MX-7 BOARD ㊴
MX-7 BOARD ⑨, ⑩
MX-7 BOARD ⑦, ⑧
(See page 93.)
VC-63P BOARD
IC006
SAMPLING
(See page 145.)
MX-7 BOARD
IC002
MATRIX
IC001
1H DELAY
IC003
1H DELAY
IC004
CCD DETECT COMPENSATOR
IC001
SYNC GENERATOR
IC621
SYNC GENERATOR
PR-20 BOARD
(See page 146.)
IC002
PROCESS
CN701
B CONT
R CONT
RV726 B CONT
RV725 R CONT
RV709 B GAIN
RV708 R GAIN
RV710 CHROMA LEVEL
RV707 C1 GAIN
RV705 C2 GAIN
RV706 Y1 GAIN
RV722 BURST LEVEL
MX-7 BOARD ㉓
MX-7 BOARD ㉖
MX-7 BOARD ㉕
MX-7 BOARD ㊱
MX-7 BOARD ㉒
MX-7 BOARD ㉚, ㉝
DT-73 BOARD ⑮, ⑯
DT-73 BOARD ⑧, ⑨, ⑪
DT-73 BOARD ⑦
DT-73 BOARD ⑥
DT-73 BOARD ⑤
DT-73 BOARD ③
IC621 ①
IC621 ㉜
IC621 ㉛
IC621 ⑦
IC701 ⑮
IC701 ㊵
X620 28.3750MHz OSC
X621 17MHz
14.188MHz
Q634 BUFFER
FL701 LPF
Q701 BUFFER
FL702,703 LPF
Q702 BUFFER
FL704,705 DELAY
FL706 0.18μsec DELAY
Q633 WINDOW PULSE GENERATOR
Q712 BUFFER
Q710 BLK
MODULATOR
MATRIX
GATE
0.56Vp-p
0.7Vp-p
4Vp-p
0.2Vp-p
0.14Vp-p
0.22Vp-p
0.4Vp-p
0.28Vp-p
0.59Vp-p
5Vp-p
0.3Vp-p
0.5Vp-p
0.8Vp-p
0.9Vp-p
7.5Vp-p


MX-7 BOARD ⑨, ⑩
MX-7 BOARD ⑦, ⑧
0.14Vp-p
0.22Vp-p
2H
IC001
1H DELAY
CLAMP
1H DELAY
BUFFER
Q708,709
Q009(1/2)
Q008(1/2)
A IN
A OUT
B IN
B OUT
C IN
C OUT
D IN
D OUT
XDL 2
XDL 1
CLP 3
5V (W701 ㉑)
MX-7 BOARD ㉓
MX-7 BOARD ㉖
MX-7 BOARD ㉕
0.4Vp-p
0.28Vp-p
0.59Vp-p
CN701
B CONT
R CONT
RV726 B CONT
RV725 R CONT
RV709 B GAIN
RV708 R GAIN
RV710 CHROMA LEVEL
RV713 R-Y HUE
RV712 B-Y HUE
RV715 R-Y GAIN
RV714 B-Y GAIN
5V (W701 ⑭)
PR-20 BOARD
(See page 146.)
IC002
PROCESS
C LEVEL
C PED
G OUT
OFFSET CONT
GATE DET
PED
MATRIX
YL MATRIX
YL MATRIX 2
CLP
GATE
YL MIX
C-γ CONT
Q001,002 LOWER LIMITER
YL-YH OUT
YH OUT
Q007 MIX
Y-γ CONT
AGC CONT
CLP 2
IC001
BLANKING/CLAMP
CLAMP
BLANKING
Q005 TITLE (R-Y) MIX
Q006 LPF
Q003 TITLE (B-Y) MIX
Q004 LPF
PED
C BLK
TR
TB
TY
TY MATRIX
RV711 CHROMA BLANKING LEVEL
PR-20 BOARD ㉒
PR-20 BOARD ㉑
0.5Vp-p
0.26Vp-p
CN704
YLPF OUT
S2
YO
YI
CO
CI
CN705
OFFSET MTX
YH OUT
CS Y
YL-YH
ID
OFFSET PRO
GΓ/G WB
R OUT
B OUT
G OUT
DC OUT
R MTX
B MTX
CS GAIN
CS Y OUT
Q006 BUFFER
Q007 LPF
Q010 BLANKING
HD MIX
VCS GAIN
SLICE
COMP
MAX
MX-7 BOARD ㊱
0.14Vp-p
F702,703 LPF
Q702 BUFFER
Y GAIN
YL IN
AGC MIX
SW
Q004 BUFFER
Q005 LPF
FL704,705 DELAY
YH
YL-YH
5V
IC701 ⑮
0.4Vp-p
IC701
ENCODER
MODULATOR
DET
BLANKING FADER SUPRESS
C OUT
FL707 3.58MHz BPF
Q705 BUFFER
C IN
Q710 BLK
RV722 BURST LEVEL
LALT
4FSC
1/2 ALT
1/2
MOD
BURST GATE
HUE
BF
SYNC CHROMA CHARACTER MIX
RV720 SYNC LEVEL
YL-YH
SHP CLP
GAIN CONTROL
WHITE CLIP
Y FADER
Y BLK
SYNC CHARACTER MIX
FL706 0.18μsec DELAY
RV716 SHP LEVEL
RV717 Y LEVEL
RV718 WHITE CLIP
RV719 SET UP
DELAY Q711
CLP 2
IC701 ㊵
0.5Vp-p
MX-7 BOARD ㉚, ㉝
㉚:1Vp-p
㉛:0.26Vp-p
MX-7 BOARD ㉒
0.3Vp-p
IC701 ㉔
0.7Vp-p
IC701 ㉖
0.28Vp-p
CN702
C OUT
FADER CONT
Y OUT
BLK
VIDEO (VA-43)
CN703
TB
TG
TR
C BLK
RV724 TITLE
MIX
TY
Y BLK
A/D Y
BACK LIGHT
VD
HD
DIGITAL TITLE (SS-93P)
EN
DATA TO SLAVE
CLK
CAM STB
EVER 5V
DATA TO SLAVE
CLK
CAM STB
SYSTEM CONTROL (SS-93P)
IC701 ⑯
2.6Vp-p
IC701 ㉒
1Vp-p

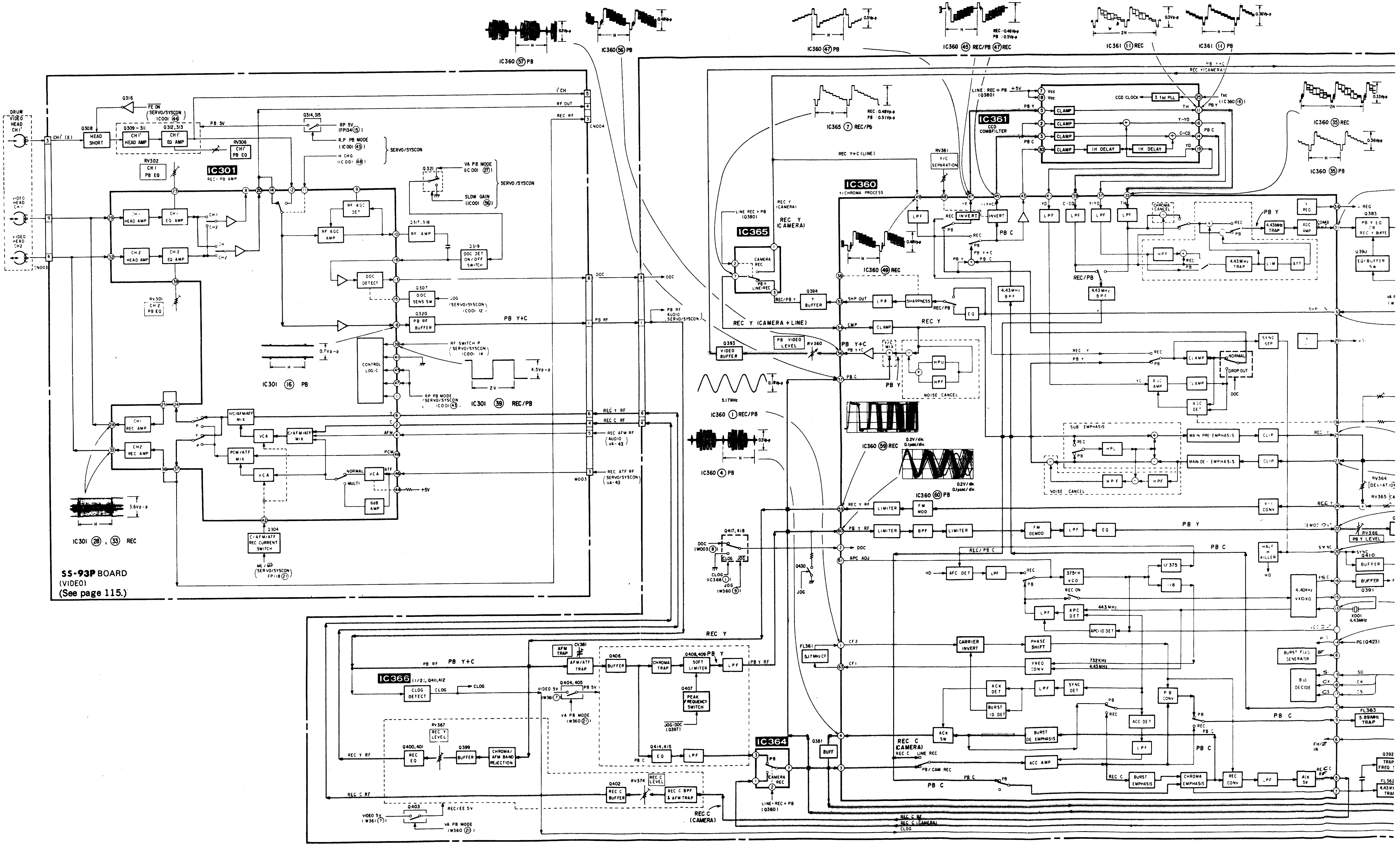
3-4. AUTO FOCUS BLOCK DIAGRAM

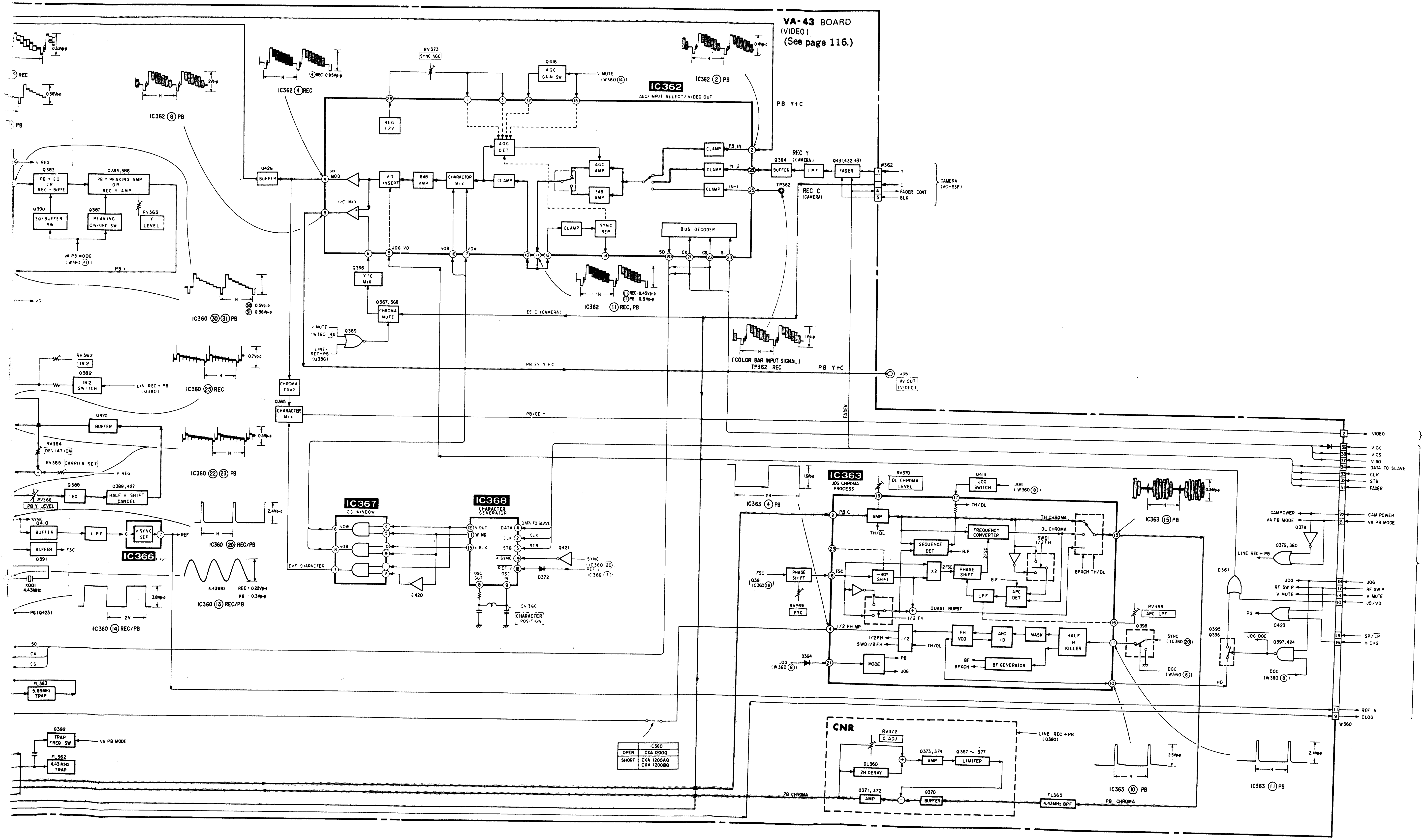

INFRARED BEEM DETECTOR
A
B
A OUT
B OUT
PUL4001
2
4
INFRARED BEEM TRANSMITTER
IRED
PUL4002
AF BLOCK UNIT
IC4001
PREAMP/INFRARED CONTROL
25 A IN
26 B IN
V REF 9
MN 8
MF 7
HL 6
MODE 1 4
MODE 2 3
CLK 5
2 IROR
1 IRFB
NN 11
FF 10
Q4001
LED DRIVE
IC4002
AUTO FOCUS CONTROL
11 VL
12 MN
13 MF
14 HL
AF SW 15
4 MODE 1
6 MODE 2
7 CLK
SOC2 3
SOC1 2
SERC
Q4002
SENSOR SWITCH
IC4003
ZOOM MOTOR DRIVE
7
8
2
3
PF-NN
PF-FF
COM
PUL4006
SW BLOCK UNIT
AF CONT
W SW
T SW
PUL4005
DIGITAL TITTE (SS-93P)
TELE
WIDE
PUL4004
M906 ZOOM MOTOR
M
MO NN
MO FF
PUL4003
M905 FOCUS MOTOR
AF BOARD (See page 97.)

3-5. DIGITAL TITLER BLOCK DIAGRAM

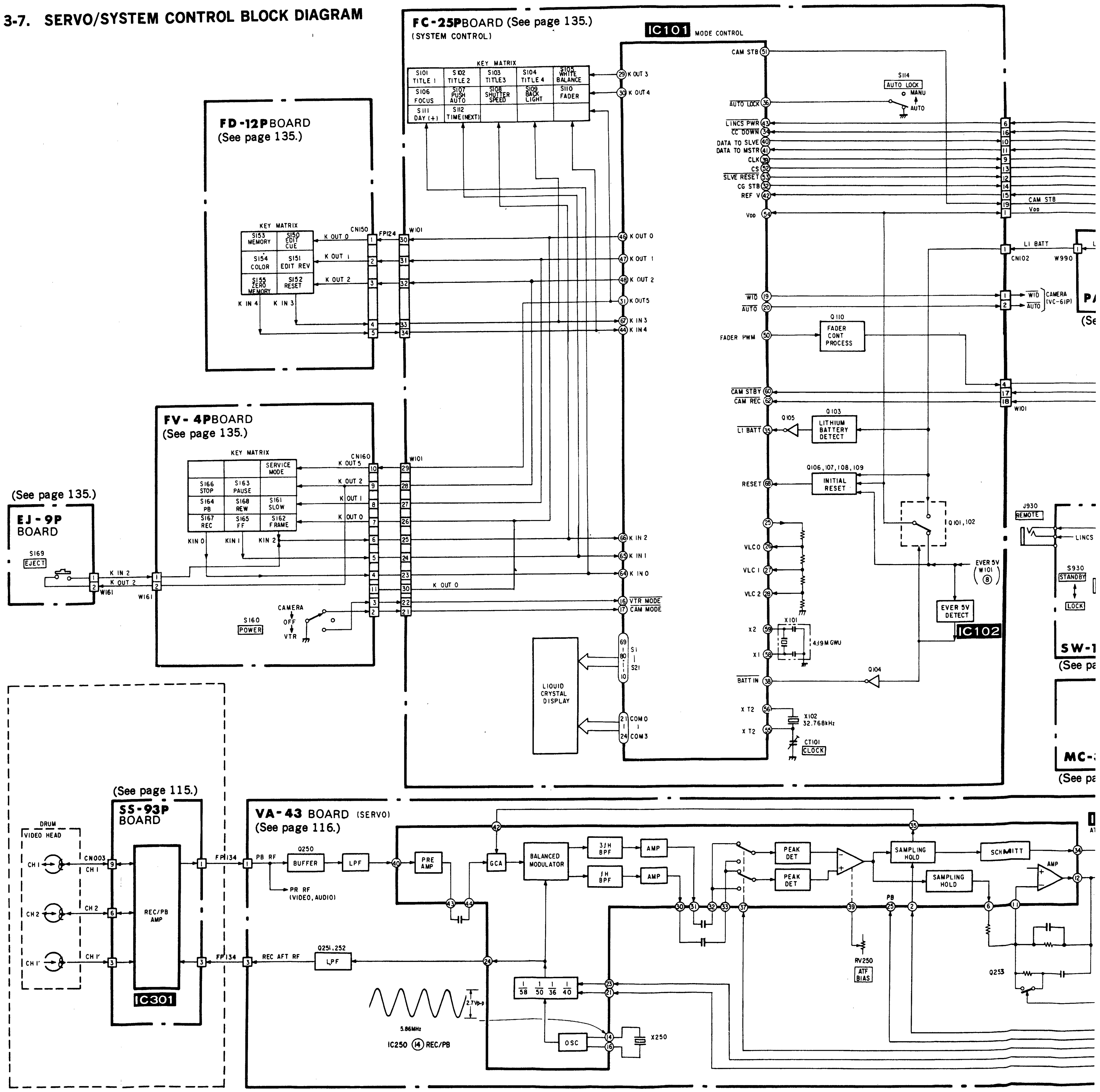

IC201
TITLE MEMORY
256k BIT STATIC MEMORY
VDD
5V
CS
I/O 1 - I/O 8
11-13, 15-19
OE
WE
A0 - A5
10 - 5
A6 - A13
4, 3, 25, 24, 21, 23, 2, 26
A14
IC202
DIGITAL TITLE PROCESS
19-17, 63-59
20-24, 27
28, 29, 51, 52, 55, 53, 30, 50
A14
CG BK
CG IN
CG MK
IC203
A-D CONVERTER
Q201, 202
CLAMP
RV200
A-D CONVERTER REFERENCE LEVEL
SHIFT IN
TITLE Y WRITE
S→P
P→S
TIMING GENERATOR
H ADDRESS COUNTER
H TITLE AREA
V ADDRESS COUNTER
A14 GENERATOR
CHRACTOR MIX
YR, YG, YB SYNTHESIS
EDGE SYNTHESIS
Y MATRIX
TITLE Y READ
Y RO
Y GO
Y BO
CR, CG, CB SYNTHESIS
C RO
C GO
C BO
C BLK
TITLE C READ
TITLE Y+C READ
INVERT
Y/C DELAY
V TITLE AREA
V TITLE AREA SCROLL MODE GENERATOR
FRAME DETECT
VD
HD
PHASE DETECT
H TIMING GENERATOR
SYSTEM MODE COMMAND
COMMAND DECODE
SYSTEM RESET
MASTER LOCK
STB
SI
SCK
LCLR
BUSY
OSC O
OSC I
PD UP
XP DN
LPF
CT200
TITLE POSITION
D203
VCO
TITLE Y WRITE
W004
A-D Y
TY
Y BLK
TR
TG
TB
C BLK
VD
HD
CAMERA (VC-63P)
BACK LIGHT
SS-93P BOARD (See page 105.)
(DIGITAL TITLE)
IC200
DIGITAL TITLE CONTROL
CN007
VDD
SLAVE RESET
CS
CLK
DATA TO MASTER
DATA TO SLAVE
LINCS POWER
SYSTEM CONTROL (FC-25P)
Q206
Q204
Q205
SLAVE RESET
CS
CLK
DATA TO MASTER
DATA TO SLAVE
LO
LI
TELE IN
WIDE IN
TITLE CS
RAM CS
T SO
T SCK
D201
BACK LIGHT
BUSY
AF ON
TELE OUT
WIDE OUT
CL1
CL2
X200
TALLY
Q203
CN005
AF CONT
T SW
W SW
AUTO FOCUS (AF)
FP-134
TALLY
EVF (VF-13P)
ZM-10P BOARD
(See page 124.)
S970
TELE
S971
WIDE
J930
REMOTE
CN930
CN931
LINCS POWER
TELE
WIDE
W001
SW-111P BOARD
(See page 124.)

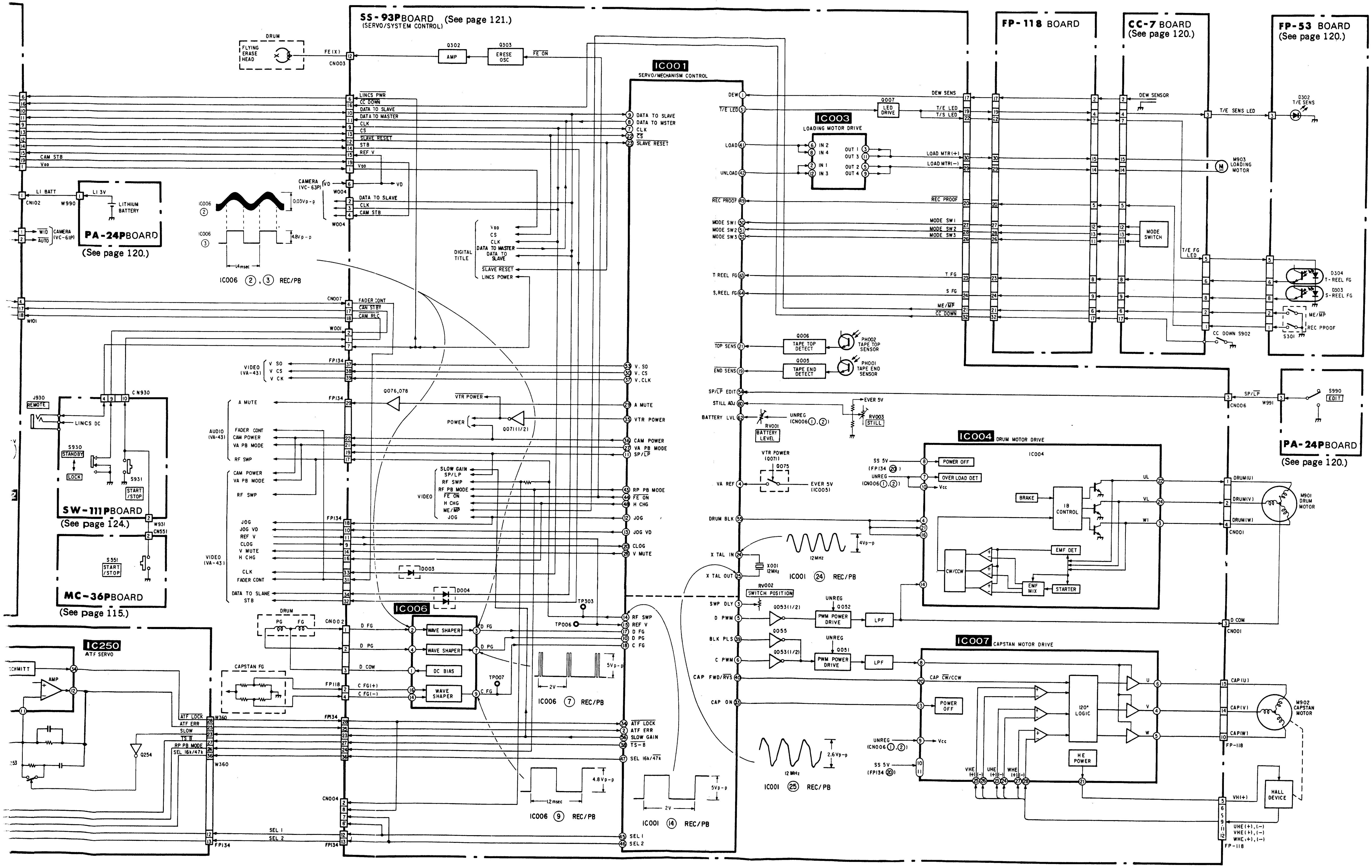
3-6. VIDEO BLOCK DIAGRAM


IC360 (57) PB
IC360 (56) PB
IC360 (47) PB
IC360 (45) REC/PB (47) REC
IC361 (11) REC
IC361 (11) PB
IC360 (35) REC
IC360 (35) PB
IC365 (7) REC/PB
IC360 (48) REC
IC360 (1) REC/PB
IC360 (4) PB
IC360 (59) REC
IC360 (60) PB
IC301 (16) PB
IC301 (39) REC/PB
IC301 (28), (33) REC
DRUM VIDEO HEAD CH1'
VIDEO HEAD CH1
VIDEO HEAD CH2
CN003
CN004
W003
IC301
REC/PB AMP
HEAD SHORT
CH1' HEAD AMP
CH1' EQ AMP
CH1' PB EQ
CH1 HEAD AMP
CH1 EQ AMP
CH2 HEAD AMP
CH2 EQ AMP
RF AGC DET
RF AGC AMP
RF AMP
DOC DETECT
DOC SENS SW
PB RF BUFFER
DOC DET ON/OFF SWITCH
CONTROL LOGIC
CH1 REC AMP
CH2 REC AMP
Y/C/AFM/ATF MIX
C/AFM/ATF MIX
PCM/ATF MIX
VCA
6dB AMP
C/AFM/ATF REC CURRENT SWITCH
SERVO/SYSCON
PB Y+C
SS-93P BOARD
(VIDEO)
(See page 115.)
IC366
CLOG DETECT
AFM TRAP
AFM/ATF TRAP
BUFFER
CHROMA TRAP
SOFT LIMITER
LPF
PEAK FREQUENCY SWITCH
REC EQ
CHROMA/AFM BAND REJECTION
REC C BUFFER
REC C BPF & AFM TRAP
REC Y RF
REC C RF
IC365
CAMERA REC
REC Y (CAMERA)
IC364
CAMERA REC
IC360
Y/CHROMA PROCESS
IC361
CCD COMBFILTER
CLAMP
1H DELAY
3 fsc PLL
CCD CLOCK
Y BUFFER
SHARPNESS
VIDEO BUFFER
PB VIDEO LEVEL
Y/C MIX
NOISE CANCEL
LIMITER
FM MOD
BPF
FM DEMOD
EQ
SUB EMPHASIS
MAIN PRE-EMPHASIS
MAIN DE-EMPHASIS
CLIP
SYNC SEP
DROP OUT
AGC AMP
4.43MHz TRAP
4.43MHz BPF
AFC DET
375fH VCO
APC DET
APC-ID DET
1/375
1/8
CARRIER INVERT
PHASE SHIFT
FREQ CONV
ACK DET
BURST ID DET
SYNC DET
ACK SW
BURST DE-EMPHASIS
BURST EMPHASIS
CHROMA EMPHASIS
REC CONV
ACC AMP
ACC DET
PB CONV
HALF H KILLER
4.43MHz VXO
BURST FLAG GENERATOR
BUS DECODE
FL363 5.89MHz TRAP
FL361 5.17MHz CF
X001 4.43MHz
PB Y
PB C
REC C (CAMERA)
REC Y (CAMERA + LINE)


VA-43 BOARD
(VIDEO)
(See page 116.)
IC362
AGC/INPUT SELECT/VIDEO OUT
RV373
SYNC AGC
Q416
AGC GAIN SW
V MUTE (W360 ⑭)
REG 1.2V
AGC DET
AGC AMP
3dB AMP
CLAMP
SYNC SEP
BUS DECODER
V D INSERT
6dB AMP
CHARACTOR MIX
Y/C MIX
Q426
BUFFER
RF MOD
JOG VD
VDB
VDW
PB IN
IN-2
IN-1
SO
CK
CS
SI
PB Y+C
REC Y (CAMERA)
REC C (CAMERA)
Q364
BUFFER
LPF
Q431,432,437
FADER
W362
CAMERA (VC-63P)
Y
C
FADER CONT
BLK
TP362
(COLOR BAR INPUT SIGNAL)
TP362 REC
IC362 ② PB
IC362 ④ REC
IC362 ⑧ PB
IC362 ⑪ REC,PB
⑪ REC: 0.45Vp-p
⑪ PB: 0.5Vp-p
④ REC: 0.95Vp-p
0.4Vp-p
1Vp-p
Q366
Y/C MIX
Q367,368
CHROMA MUTE
EE C (CAMERA)
V MUTE (W160 ④)
Q369
LINE-REC+PB (Q380)
PB EE Y+C
J361
AV OUT (VIDEO)
PB/EE Y
Q365
CHROMA TRAP
CHARACTER MIX
FADER
Q383
PB Y EQ OR REC Y BUFFE
Q385,386
PB Y PEAKING AMP OR REC Y AMP
Q390
EQ/BUFFER SW
Q387
PEAKING ON/OFF SW
RV363
Y LEVEL
VA PB MODE (W360 ㉑)
PB Y
IC360 ㉚ ㉛ PB
㉚ 0.5Vp-p
㉛ 0.56Vp-p
RV362
IR2
Q382
IR2 SWITCH
LIN REC+PB (Q380)
IC360 ㉕ REC
0.7Vp-p
Q425
BUFFER
RV364
DEVIATION
RV365
CARRIER SET
V REG
IC360 ㉒ ㉓ PB
0.5Vp-p
Q388
EQ
Q389,427
HALF H SHIFT CANCEL
RV366
PB Y LEVEL
SYNC
Q410
BUFFER
LPF
V SYNC SEP
IC366
REF
BUFFER
FSC
Q391
X001
4.43MHz
PG (Q423)
IC360 ⑳ REC/PB
2.4Vp-p
4.43MHz
REC: 0.22Vp-p
PB: 0.3Vp-p
IC360 ⑬ REC/PB
3.8Vp-p
2V
IC360 ⑭ REC/PB
SO
CK
CS
FL363
5.89MHz TRAP
Q392
TRAP FREQ SW
VA PB MODE
FL362
4.43MHz TRAP
IC367
CS WINDOW
VDW
VDB
EVF CHARACTER
Q420
IC368
CHARACTER GENERATOR
V OUT
WIND
V BLK
DATA
CLK
STB
H SYNC
REF V
OSC OUT
OSC IN
DATA TO SLAVE
Q421
SYNC (IC360 ⑳)
REF V (IC366 ⑦)
Q372
CV360
CHARACTER POSITION
IC360
OPEN CXA 1200Q
SHORT CXA 1200AQ CXA 1200BQ
IC363
JOG CHROMA PROCESS
RV370
DL CHROMA LEVEL
Q413
JOG SWITCH
JOG (W360 ⑧)
IC363 ④ PB
1.8Vp-p
2H
PB.C
AMP
TH/DL
SEQUENCE DET
FREQUENCY CONVERTER
TH CHROMA
DL CHROMA
SWD1 1/2FH
2FSC
B.F
FSC
Q391 (IC360 ⑯)
PHASE SHIFT
RV369
FSC
-90° SHIFT
X2
PHASE SHIFT
LPF
APC DET
QUASI BURST
1/2 FH
1/2 FH MP
1/2FH
SWD1/2FH
1/2
FH VCO
AFC ID
MASK
HALF H KILLER
BF
BFXCH
BF GENERATOR
BFXCH TH/DL
MODE
PB
JOG
Q364
JOG (W360 ⑧)
RV368
APC LPF
Q398
SYNC (IC360 ⑳)
DOC (W360 ⑧)
IC363 ⑮ PB
0.34Vp-p
Q361
Q395
Q396
HD
JOG DOC
Q397,424
DOC (W360 ⑧)
Q423
PG
Q379,380
LINE REC+PB
Q378
CAMPOWER
VA PB MODE
JOG
RF SW P
V MUTE
W360
VIDEO
V CK
V CS
V SO
DATA TO SLAVE
CLK
STB
FADER
EVF (VF-13P)
CAM POWER
VA PB MODE
JOG
RF SW P
V MUTE
JO/VD
SP/LP
H CHG
SERVO/SYSCON (SS-93P)
REF V
CLOG
CNR
RV372
C ADJ
Q373,374
AMP
Q357~377
LIMITER
DL360
2H DERAY
Q371,372
AMP
Q370
BUFFER
FL365
4.43MHz BPF
PB CHROMA
LINE-REC+PB (Q380)
IC363 ⑩ PB
2.5Vp-p
IC363 ⑪ PB
2.4Vp-p

3-7. SERVO/SYSTEM CONTROL BLOCK DIAGRAM


FC-25P BOARD (See page 135.)
(SYSTEM CONTROL)
IC101 MODE CONTROL
KEY MATRIX
S101 TITLE 1
S102 TITLE 2
S103 TITLE 3
S104 TITLE 4
S105 WHITE BALANCE
S106 FOCUS
S107 PUSH AUTO
S108 SHUTTER SPEED
S109 BACK LIGHT
S110 FADER
S111 DAY (+)
S112 TIME (NEXT)
K OUT 3
K OUT 4
CAM STB
S114
AUTO LOCK
MANU
AUTO
LINCS PWR
CC DOWN
DATA TO SLVE
DATA TO MSTR
CLK
CS
SLVE RESET
CG STB
REF V
VDD
K OUT 0
K OUT 1
K OUT 2
K OUT 5
K IN 3
K IN 4
WID
AUTO
Q110
FADER CONT PROCESS
FADER PWM
CAM STBY
CAM REC
Q103
LITHIUM BATTERY DETECT
Q105
LI BATT
Q106, 107, 108, 109
INITIAL RESET
RESET
Q101, 102
VLC0
VLC1
VLC2
K IN 2
K IN 1
K IN 0
VTR MODE
CAM MODE
X2
X1
X101
4.19MGWU
EVER 5V (W101)
EVER 5V DETECT
IC102
Q104
BATT IN
LIQUID CRYSTAL DISPLAY
S1 - S21
COM0 - COM3
XT2
X102 32.768kHz
CT101 CLOCK
CAM STB
VDD
LI BATT
CN102
W990
CAMERA (VC-61P)
W101
J930 REMOTE
LINCS
S930 STANDBY
LOCK
SW-1
MC-
FD-12P BOARD (See page 135.)
KEY MATRIX
S153 MEMORY
S150 EDIT CUE
S154 COLOR
S151 EDIT REV
S155 ZERO MEMORY
S152 RESET
CN150
FP124
W101
K OUT 0
K OUT 1
K OUT 2
K IN 4
K IN 3
FV-4P BOARD (See page 135.)
KEY MATRIX
SERVICE MODE
S166 STOP
S163 PAUSE
S164 PB
S168 REW
S161 SLOW
S167 REC
S165 FF
S162 FRAME
CN160
K OUT 5
K OUT 2
K OUT 1
K OUT 0
KIN 0
KIN 1
KIN 2
S160 POWER
CAMERA
OFF
VTR
(See page 135.)
EJ-9P BOARD
S169 EJECT
K IN 2
K OUT 2
W161
(See page 115.)
SS-93P BOARD
DRUM VIDEO HEAD
CH1
CH2
CH1'
CN003
REC/PB AMP
IC301
FP134
VA-43 BOARD (SERVO)
(See page 116.)
PB RF
Q250
BUFFER
LPF
PR RF (VIDEO, AUDIO)
REC AFT RF
Q251, 252
LPF
PRE AMP
GCA
BALANCED MODULATOR
3fH BPF
fH BPF
AMP
PEAK DET
SAMPLING HOLD
SCHMITT
AMP
58 50 36 40
OSC
X250
5.86MHz
2.7Vp-p
IC250 (14) REC/PB
RV250 ATF BIAS
Q253
PB



SS-93P BOARD (See page 121.)
(SERVO/SYSTEM CONTROL)
DRUM
FLYING ERASE HEAD
FE(X)
CN003
Q302 AMP
Q303 ERESE OSC
FE ON
IC001
SERVO/MECHANISM CONTROL
LINCS PWR
CC DOWN
DATA TO SLAVE
DATA TO MASTER
CLK
CS
SLAVE RESET
STB
REF V
VDD
CAM STB
CAMERA (VC-63P)
VD
W004
LI BATT
CN102
W990
LI 3V
LITHIUM BATTERY
PA-24P BOARD
(See page 120.)
WID
AUTO
CAMERA (VC-61P)
IC006 ②
IC006 ③
0.03Vp-p
4.8Vp-p
1.4msec
IC006 ②, ③ REC/PB
DIGITAL TITLE
SLAVE RESET
LINCS POWER
CN007
FADER CONT
CAN STBY
CAM RLC
W001
FP134
VIDEO (VA-43)
V SO
V CS
V CK
V.SO
V.CS
V.CLK
J930 REMOTE
LINCS DC
CN930
S930 STANDBY
LOCK
S931 START/STOP
SW-111P BOARD
(See page 124.)
W931
CN551
S551 START/STOP
MC-36P BOARD
(See page 115.)
A MUTE
Q076,078
VTR POWER
POWER
Q071(1/2)
AUDIO (VA-43)
FADER CONT
CAM POWER
VA PB MODE
RF SWP
SP/LP
SLOW GAIN
RF PB MODE
FE ON
H CHG
ME/MP
JOG
JOG VD
CLOG
V MUTE
FADER CONT
DATA TO SLANE
STB
D003
D004
IC006
WAVE SHAPER
DC BIAS
TP303
TP006
TP007
D FG
D PG
D COW
C FG(+)
C FG(-)
C FG
CAPSTAN FG
FP118
5Vp-p
2V
IC006 ⑦ REC/PB
IC250
ATF SERVO
SCHMITT
AMP
Q254
W360
ATF LOCK
ATF ERR
SLOW
TS B
RP PB MODE
SEL 16k/47k
TS-B
4.8Vp-p
1.2msec
IC006 ⑨ REC/PB
CN004
SEL 1
SEL 2
IC001 ⑭ REC/PB
DEW
T/E LED
LOAD
UNLOAD
REC PROOF
MODE SW1
MODE SW2
MODE SW3
T REEL FG
S REEL FG
TOP SENS
END SENS
SP/LP EDIT
STILL ADJ
BATTERY LVL
VA REF
DRUM BLK
X TAL IN
X TAL OUT
SWP DLY
D PWM
BLK PLS
C PWM
CAP FWD/RVS
CAP ON
Q007 LED DRIVE
IC003
LOADING MOTOR DRIVE
IN 2
IN 4
IN 1
IN 3
OUT 1
OUT 3
OUT 2
OUT 4
LOAD MTR(+)
LOAD MTR(-)
DEW SENS
T/E LED
T/S LED
T FG
S FG
ME/MP
CC DOWN
Q006 TAPE TOP DETECT
PH002 TAPE TOP SENSOR
Q005 TAPE END DETECT
PH001 TAPE END SENSOR
EVER 5V
RV003 STILL
RV001 BATTERY LEVEL
UNREG (CN006 ①, ②)
VTR POWER (Q071)
Q075
EVER 5V (IC005)
12MHz
4Vp-p
X001 12MHz
IC001 ㉔ REC/PB
RV002 SWITCH POSITION
Q053(1/2)
Q052
Q055
Q051
PWM POWER DRIVE
LPF
2.6Vp-p
12 MHz
IC001 ㉕ REC/PB
FP-118 BOARD
CC-7 BOARD
(See page 120.)
DEW SENSOR
MODE SWITCH
M903 LOADING MOTOR
FP-53 BOARD
(See page 120.)
T/E SENS LED
D302 T/E SENS
T/E FG LED
D304 T-REEL FG
D303 S-REEL FG
ME/MP
REC PROOF
CC DOWN S902
S301
SP/LP
S990 EDIT
CN006
W991
PA-24P BOARD
(See page 120.)
IC004 DRUM MOTOR DRIVE
SS 5V (FP134 ⑳)
POWER OFF
OVER LOAD DET
BRAKE
IB CONTROL
CW/CCW
EMF DET
EMF MIX
STARTER
DRUM(U)
DRUM(V)
DRUM(W)
CN001
M901 DRUM MOTOR
D COM
IC007 CAPSTAN MOTOR DRIVE
CAP CW/CCW
POWER OFF
120° LOGIC
HE POWER
CAP(U)
CAP(V)
CAP(W)
M902 CAPSTAN MOTOR
FP-118
VH(+)
HALL DEVICE
UHE(+),(-)
VHE(+),(-)
WHE(+),(-)

3-8. MECHANISM CONTROLLER (μPD78112-GF)

This is the 8-bit, single chip microprocessor having the following characteristics.

- μCOM-78K/I
- high speed instruction execution
  Instruction cycle : 333ns/12MHz
- On-chip memory mapping for peripheral hardware (special function register)
- On-chip high function interrupt controller
  Two kinds of processing forms (vector interrupt function/ macro service function)
- On-chip high precision A/D converter
  8 bit precision : 8 analog inputs
  One analog input conversion time : 26.7μs/12MHz
- On-chip hardware suitable for servo control of VTR, etc. (servo control unit)
  16 bit free running counter+capture register×2
  special pulse output control function 12 bit precision PWM output×2

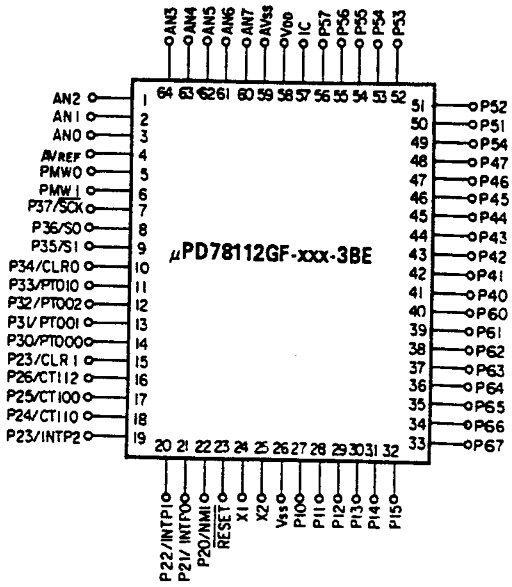

AN3
AN4
AN5
AN6
AN7
AVss
VDD
IC
P57
P56
P55
P54
P53
AN2
AN1
AN0
AVREF
PMW0
PMW1
P37/$\overline{SCK}$
P36/S0
P35/S1
P34/CLR0
P33/PT010
P32/PT002
P31/PT001
P30/PT000
P23/CLR1
P26/CT112
P25/CT100
P24/CT110
P23/INTP2
μPD78112GF-xxx-3BE
P52
P51
P54
P47
P46
P45
P44
P43
P42
P41
P40
P60
P61
P62
P63
P64
P65
P66
P67
P22/INTP1
P21/INTP0
P20/NMI
$\overline{RESET}$
X1
X2
Vss
P10
P11
P12
P13
P14
P15

Fig. 1. μPD78112 pin assignment diagram

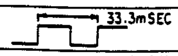
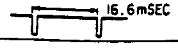
Pin No.	Signal name	I/O	Signal status	Function
1	DEW	I	Analog input	DEW detecting pin. When DEW (condensation) occurs, more than 430mV generates.
2	ATF ERR	I	Analog input	ATF ERROR input pin.
3	SWP DLY	I	Analog input	RF SWP adjustment input pin.
4	VA REF	O		A/D converter reference voltage input pin.
5	D PWM	O	PWM output	Drum motor drive signal.
6	C PWM	O	PWM output	Capstan motor drive signal.
7	CLK	I		Serial communication clock input.
8	DATA TO MSTR	O		Data output pin for the data to be sent to mode control CPU.
9	DATA TO SLVE	I		Data input pin for the data coming from the mode control CPU.
10	D PG	I		Drum PG input pin.
11	SP/$\overline{LP}$	O	Logic status	Playback mode output pin. SP="H", LP="L"
12	JOG	O	Logic status	Video circuit normal/variable speed playback select signal. "H" during STILL, SLOW, FRAM, CUE/REV, FR SEARCH, REC REV, EDIT CUE, EDIT REV.
13	JOG VD	O	Logic status	False VD output inserted into video signal during variable speed playback mode.
14	RF SWP	O		RF SWP output pin.
15	REF V	I		REF V input pin.
16				
17	D FG	I		Drum FG input.
18	C FG	I		Capstan FG input.
19	$\overline{END\ SENS}$	I	Logic status	END-side END sensor input.

Table 1 (1)

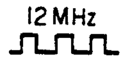
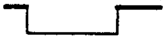
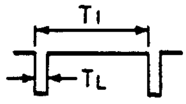
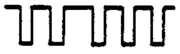
<table>
<tr><th>Pin No.</th><th>Signal name</th><th>I/O</th><th>Signal status</th><th>Function</th></tr>
<tr><td>20</td><td>CLOG</td><td>I</td><td>Logic status</td><td>Head clogging detect input.</td></tr>
<tr><td>21</td><td>$\overline{\text{TOP SENS}}$</td><td>I</td><td>Logic status</td><td>TOP-side TOP sensor input.</td></tr>
<tr><td>22</td><td>$\overline{\text{CS}}$</td><td>I</td><td>Logic status</td><td>Input signal to start data communication. Starting at fall-down edge.</td></tr>
<tr><td>23</td><td>$\overline{\text{SLVE RESET}}$</td><td>I</td><td>Logic status</td><td>RESET input. "L" RESET.</td></tr>
<tr><td>24</td><td>X'TAL IN</td><td>I</td><td rowspan="2"> </td><td>To be used for system clock. X'tal should be connected.</td></tr>
<tr><td>25</td><td>X'TAL OUT</td><td>O</td><td>To be used for system clock. X'tal should be connected.</td></tr>
<tr><td>26</td><td>V_{ss}</td><td></td><td></td><td>GND pin</td></tr>
<tr><td>27</td><td>VA PB MODE</td><td>O</td><td>Logic status</td><td>Video, audio REC/PB select signal. "H" during PB.</td></tr>
<tr><td>28</td><td>V MUTE</td><td>O</td><td>Logic status</td><td>Video, muting signal. "H" during muting.</td></tr>
<tr><td>29</td><td>A MUTE</td><td>O</td><td>Logic status</td><td>Audio, muting signal. "H" during muting.</td></tr>
<tr><td>30</td><td>VIDEO CS</td><td>O</td><td></td><td>Input signal to start video data communication.</td></tr>
<tr><td>31</td><td>$\overline{\text{T/E LED}}$</td><td>O</td><td> </td><td>Tape top/end detecting LED ON/OFF.
Reel rotation detecting LED ON/OFF.
<table>
<tr><th>mode</th><th>REC/PB</th><th>CUE/REV</th><th>FF/REW</th></tr>
<tr><td>T_I</td><td>100</td><td>14</td><td>2</td></tr>
<tr><td>T_L</td><td>1</td><td>1</td><td>1</td></tr>
</table>
(unit in msec)</td></tr>
<tr><td>32</td><td></td><td></td><td></td><td></td></tr>
<tr><td>33</td><td>CAP ON</td><td>O</td><td>Logic status</td><td>Capstan motor ON/OFF signal. "H" level means capstan motor ON.</td></tr>
<tr><td>34</td><td>$\overline{\text{ATF LOCK}}$</td><td>I</td><td>Logic status</td><td>"L" when PB mode ATF phase servo is normally phase-locked.</td></tr>
<tr><td>35</td><td>VTR Power</td><td>O</td><td>Logic status</td><td rowspan="2">DC-DC converter ON/OFF signal.
<table>
<tr><th>mode</th><th>VTR Power</th><th>CAM Power</th></tr>
<tr><td>VTR</td><td>"H"</td><td>"L"</td></tr>
<tr><td>OFF</td><td>"L"</td><td>"L"</td></tr>
<tr><td>CAM</td><td>"H"</td><td>"H"</td></tr>
</table></td></tr>
<tr><td>36</td><td>CAM Power</td><td>O</td><td>Logic status</td></tr>
<tr><td>37</td><td>VIDEO CLK</td><td>I</td><td></td><td>Clock for video serial data communication.</td></tr>
<tr><td>38</td><td>TS B</td><td>O</td><td> </td><td>ATF LOCK sampling hold signal. "L" during sampling mode. "H" during hold mode.</td></tr>
<tr><td>39</td><td>CAP BLK</td><td>O</td><td>Logic status</td><td>This is the signal that applies full voltage to capstan motor.</td></tr>
<tr><td>40</td><td>CAP FWD/$\overline{\text{RVS}}$</td><td>O</td><td>Logic status</td><td>Capstan motor rotating direction select signal. "H" during normal direction (FWD) rotation.</td></tr>
<tr><td>41</td><td>LOAD</td><td>O</td><td>Logic status</td><td rowspan="2">Threading motor control signal.
<table>
<tr><th>Operation
Signal name</th><th>LOAD</th><th>UNLOAD</th><th>BRAKE</th></tr>
<tr><td>LOAD</td><td>H</td><td>L</td><td>H</td></tr>
<tr><td>UNLOAD</td><td>L</td><td>H</td><td>H</td></tr>
</table></td></tr>
<tr><td>42</td><td>UNLOAD</td><td>O</td><td>Logic status</td></tr>
<tr><td>43</td><td>RP PB MODE</td><td>O</td><td>Logic status</td><td>REC/PB amplifier REC/PB select signal. "H" during PB.</td></tr>
<tr><td>44</td><td>$\overline{\text{FE ON}}$</td><td>O</td><td>Logic status</td><td>Flying erase oscillation ON/OFF signal, "L" during oscillation.</td></tr>
</table>

Table 1 (2)

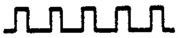
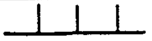
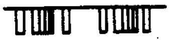
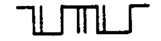
<table>
<tr><th>Pin No.</th><th>Signal name</th><th>I/O</th><th>Signal status</th><th>Function</th></tr>
<tr><td>45</td><td>SEL1</td><td>O</td><td>Logic status</td><td rowspan="2">ATF REF PILOT signal frequency control.<table><tr><td>ATF REF PILOT</td><td>f_1</td><td>f_2</td><td>f_3</td><td>f_4</td></tr><tr><td>SEL1</td><td>H</td><td>L</td><td>H</td><td>L</td></tr><tr><td>SEL2</td><td>H</td><td>H</td><td>L</td><td>L</td></tr></table></td></tr>
<tr><td>46</td><td>SEL2</td><td>O</td><td>Logic status</td></tr>
<tr><td>47</td><td>SEL 16K/$\overline{47K}$</td><td>O</td><td>Logic status</td><td>ATF BPF select signal. “L” when detecting ATF error in f1 and f3 tracks.
“H” when detecting ATF error in f2 and f4 tracks.</td></tr>
<tr><td>48</td><td>HCHG</td><td>O</td><td>Logic status</td><td>Head select signal. “H”=CH-1’ “L”=CH-1.</td></tr>
<tr><td>49</td><td>$\overline{\text{REC PROOF SW}}$</td><td>I</td><td>Logic status</td><td>“H” when cassette’s erroneous erasure preventing switch is set in the erasure prevention side.</td></tr>
<tr><td>50</td><td>MSW1</td><td>I</td><td>Logic status</td><td rowspan="3">Mechanism mode switch input (three bit structure, mechanical position detection)</td></tr>
<tr><td>51</td><td>MSW2</td><td>I</td><td>Logic status</td></tr>
<tr><td>52</td><td>MSW3</td><td>I</td><td>Logic status</td></tr>
<tr><td>53</td><td>VIDEO SO</td><td>O</td><td></td><td>Data line for the data to be sent to CXA1201.</td></tr>
<tr><td>54</td><td>$\overline{\text{EDIT}}$</td><td>I</td><td></td><td>Input signal for EDIT selection. “H” : OFF. “L”: ON</td></tr>
<tr><td>55</td><td>DRUM BLK</td><td>O</td><td>Logic status</td><td>Slow mode drum fH compensation drum brake signal.</td></tr>
<tr><td>56</td><td>SLOW GAIN</td><td>O</td><td>Logic status</td><td>ATF ERROR’s gain select signal.</td></tr>
<tr><td>57</td><td>VPP</td><td></td><td></td><td>Fixed to power supply voltage.</td></tr>
<tr><td>58</td><td>V_{DD}</td><td></td><td></td><td>Power supply pin.</td></tr>
<tr><td>59</td><td>AV_{SS}</td><td></td><td></td><td>A/D converter’s GND pin.</td></tr>
<tr><td>60</td><td>STILL ADJ</td><td>I</td><td></td><td>Const. Resistornce input.</td></tr>
<tr><td>61</td><td></td><td></td><td></td><td></td></tr>
<tr><td>62</td><td>BATT LVL</td><td>I</td><td>Analog input</td><td>BATTERY LEVEL input. This is input at approx. 1/2.</td></tr>
<tr><td>63</td><td>T REEL FG</td><td>I</td><td>Analog input</td><td>Take-up side REEL FG input. Used to detect reel rotation.</td></tr>
<tr><td>64</td><td>S REEL FG</td><td>I</td><td>Analog input</td><td>Supply side REEL FG input. Used to detect reel rotation.</td></tr>
</table>

Table 1 (3)

3-9. SYSTEM CONTROL-CAMERA BLOCK INTERFACE

Signal	I/O	Pin No.	Input/Output Level
$\overline{\text{AF ON}}$	O	SS-93P board IC200⑤	"L" when auto focus in ON.
$\overline{\text{TELE IN}}$	I	SS-93P board IC200③	"L" when zoom switch TELE is pressed.
$\overline{\text{WIDE IN}}$	I	SS-93P board IC200④	"L" when zoom switch WIDE is pressed.
$\overline{\text{TALLY}}$	O	SS-93P board IC200㊵	"L" when in CAMERA mode and REC mode.
CAM STB	O	FC-25P board IC101(51)	4V cycle "H" pulse. () Strobe signal for serial data transmission.
CLK	O	FC-25P board IC101㊴	2V cycle "L" pulse series. () Serial data transmission clock.
DATA TO SLAVE	O	FC-25P board IC101㊵	2V cycle pulse series. () Serial data transmission.
TELE OUT	O	SS-93P board IC200⑦	"H" during the zoom motor is rotating TELE direction.
WIDE OUT	O	SS-93P board IC200⑧	"H" during the zoom motor is rotating WIDE direction.
BACK LIGHT	O	SS-93P board IC200⑥	"H" during Back Light is lit.

3-10. SYSTEM CONTROL—VIDEO, AUDIO BLOCK INTERFACE

Signal	I/O	Pin No.	VTR mode													CAMERA mode			
			STOP	FF	REW	FR SEARCH		PB	PICTURE SEARCH		PB•PAUSE	FRAME	SLOW	REC	REC. PAUSE	STAND-BY	EDIT CUE	EDIT REVIEW	REC
						CUE	REVIEW		CUE	REVIEW									
SP/$\overline{\text{LP}}$	O	SS-93P board IC001⑪	H	H	H	* 1	* 1	* 2	* 1	* 1	* 1	* 1	* 1	H	H	H	H	H	H
JOG	O	SS-93P board IC001⑫	L	L	L	H	H	L	H	H	H	H	H	L	L	L	H	H	L
JOG VD	O	SS-93P board IC001⑬	L	L	L	* 3	* 3	L	* 3	* 3	* 3	* 3	* 3	L	L	L	* 3	* 3	L
RF SWP	O	SS-93P board IC001⑭	H/L	* 4	* 4	* 4	* 4	* 4	* 4	* 4	* 4	* 4	* 4	* 4	* 4	* 4	* 4	* 4	* 4
REF V	O	SS-93P board IC001⑮	* 5	* 5	* 5	L	L	L	L	L	L	L	L	* 5	* 5	* 5	L	L	* 5
CLOG	I	SS-93P board IC001⑳	H	* 6	* 6	* 6	* 6	* 6	* 6	* 6	* 6	* 6	* 6	H			* 6	* 6	H
VA PB MODE	O	SS-93P board IC001㉗	L	L	L	H	H	H	H	H	H	H	H	L	L	L	H	H	L
V MUTE	O	SS-93P board IC001㉘	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
A MUTE	O	SS-93P board IC001㉙	L	L	L	H	H	L	H	H	H	H	H	L	L	L	H	H	L
CAM PWR	O	SS-93P board IC001㊱	L	L	L	L	L	L	L	L	L	L	L	L	L	H	H	H	H
RP PB MODE	O	SS-93P board IC001㊸	H	H	H	H	H	H	H	H	H	H	H	L	H	H	H	H	L
$\overline{\text{FE ON}}$	O	SS-93P board IC001㊹	H	H	H	H	H	H	H	H	H	H	H	L	H	H	H	H	L
TAPE2/$\overline{\text{TAPE1}}$	O	FP-53 board S301	"L" when using MP type tape.																
$\overline{\text{EDIT}}$	O	PA-24P board S990	"L" when EDIT switch (PA-24 board S990) is turuned ON.																
DATA TO SLAVE	O	FC-25P board IC101㊵	V cycle "L" pulse series (VTR mode)													"L" pulse series. (CAMERA mode)			
CLK	O	FC-25P board IC101㊴	V cycle "L" pulse series (VTR mode)													"L" pulse series. (CAMERA mode)			
CG STB	O	FC-25P board IC101㉜	L	L	L	L	L	L	L	L	L	L	L	L	L	*11	*11	*11	*11

* 1 Outputs identification results is PB mode immediately preceding. SP mode "H", LP mode "L".

* 2 Outputs identification results of playback tape recording mode (SP/LP). SP mode "H", LP mode "L".

* 3 False VD signal (V cycle "H" pulse)

* 4 30Hz 50% duty pulse. Synchronized to drum rotation.

* 5 V cycle "L" pulse separated from line input video signal or camera video signal.

* 6 "H" at tape no signal portion or dropout portion. Input for head clogging detection.

* 9 V cyclse pulse.

*10 2V cyclse pulse. (⎍_⎍).

*11 2V cyclse pulse series.

3-11. SYSTEM CONTROL—SERVO PERIPHERAL CIRCUIT INTERFACE

Signal	I/O	Pin No.	VTR MODE													CAMERA MODE			
			STOP	FF	REW	FR SEARCH		PB	PICTURE SEARCH		PB•PAUSE	FRAME	SLOW	REC	REC. PAUSE	STAND-BY	EDIT CUE	EDIT REV	REC
						CUE	REVIEW		CUE	REVIEW									
ATF ERR	I	SS-93P board IC001②		* 1	* 1	* 2	* 2	* 2	* 2	* 2	* 2	* 2	* 2	* 1			* 2	* 2	* 1
SWP DLY * 3	I	SS-93P board IC001③																	
D PWM	O	SS-93P board IC001⑤	L	* 4	* 4	* 4	* 4	* 4	* 4	* 4	* 4	* 4	* 4	* 4	* 4	* 4	* 4	* 4	* 4
C PWM	O	SS-93P board IC001⑥	L	* 5	* 5	* 5	* 5	* 5	* 5	* 5	L	* 5	* 5	* 5	L	L	* 5	* 5	* 5
D PG	I	SS-93P board IC001⑩	L	* 6	* 6	* 6	* 6	* 6	* 6	* 6	* 6	* 6	* 6	* 6	* 6	* 6	* 6	* 6	* 6
RF SWP	O	SS-93P board IC001⑭	H/L	* 7	* 7	* 7	* 7	* 7	* 7	* 7	* 7	* 7	* 7	* 7	* 7	* 7	* 7	* 7	* 7
REF V	I	SS-93P board IC001⑮	* 8	* 8	* 8	L	L	L	L	L	L	L	L	* 8	* 8	* 8	L	L	* 8
D FG	I	SS-93P board IC001⑰	H	* 9	* 9	* 9	* 9	* 9	* 9	* 9	* 9	* 9	* 9	* 9	* 9	* 9	* 9	* 9	* 9
C FG	I	SS-93P board IC001⑱	H/L	*10	*10	*11	*12	*13	*11	*12	H/L	*14	*14	*13	H/L	H/L	*13	*13	*13
CAP ON	O	SS-93P board IC001㉝	L	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H
$\overline{\text{ATF LOCK}}$	I	SS-93P board IC001㉞		H	H	H	H	L	H	H	H	H	H	H	H	H	L	L	H
$\overline{\text{TS B}}$	O	SS-93P board IC001㊳	H	H	H	H	H	*15	H	H	H	H	H	H	H	H	*15	*16	H
CAP BLK	O	SS-93P board IC001㊴·	L	L	L	L	L	L	L	L	L	*17	*17	L	L	L	L	L	L
CAP FWD/$\overline{\text{RVS}}$	O	SS-93P board IC001㊵	H	H	L	H	L	H	H	L	H	H	H	H	H	H	H	L	H
SEL1	O	SS-93P board IC001㊺	L	L	L	*18	*19	*15	*18	*19	H	*20	*20	*21	L	L	*15	*16	*21
SEL2	O	SS-93P board IC001㊻	L	L	L	*18	*19	*15	*18	*19	H/L	*20	*20	*21	H	H	*15	*16	*21
SEL 16K/$\overline{\text{47K}}$	O	SS-93P board IC001㊼	L	L	L	*18	*19	*15	*18	*19	L	*20	*20	L	L	L	*15	*16	L
SLOW GAIN	O	SS-93P board IC001(56)	L	L	L	L	L	L	L	L	H	H	H	L	L	L	L	L	L

* 1 Fixed voltage approx. 2V DC.

* 2 ATF error voltage.

* 3 DC voltage set by RV002 is input.

* 4 53μsec cycle PWM wave. Duty ratio changes according to drum error signal.

* 5 53μsec cycle PWM wave. Duty ratio changes according to capstan error signal.

* 6 V cycle "H" pulse. (⊥⊥⊥)

* 7 30Hz 50% duty pulse (⎍_⎍). Synchronized to drum rotation.

* 8 V cycle "L" pulse separated from line input video signal or camera video signal.

* 9 720Hz pulse

*10 Approx. 16500Hz pulse

*11 Approx. 5900Hz pulse (SP mode)

*12 Approx. 5600Hz pulse (SP mode)

*13 Approx. 826Hz pulse (SP mode)

*14 Pulse input during step-by-step.

*15 Refer to Timing Chart 1

*16 Refer to Timing Chart 2

*17 "H" pulse output during step-by-step

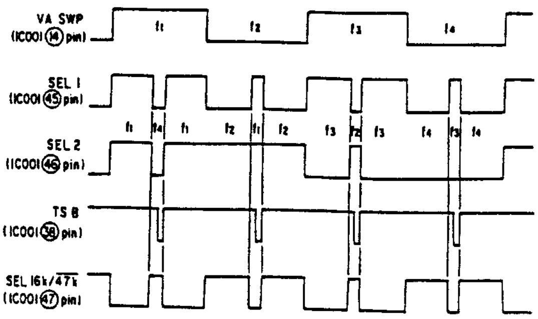
*18 Refer to Timing Chart 3

*19 Refer to Timing Chart 4

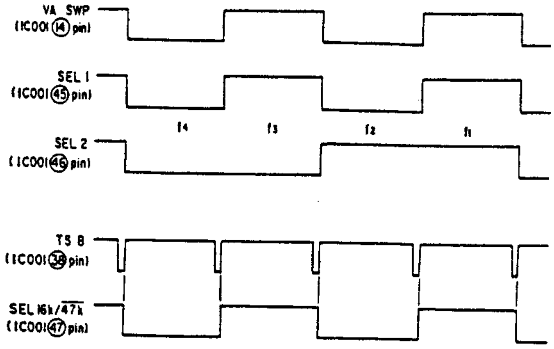
*20 Pulse output during step-by-step

*21 Refer to Timing Chart 5

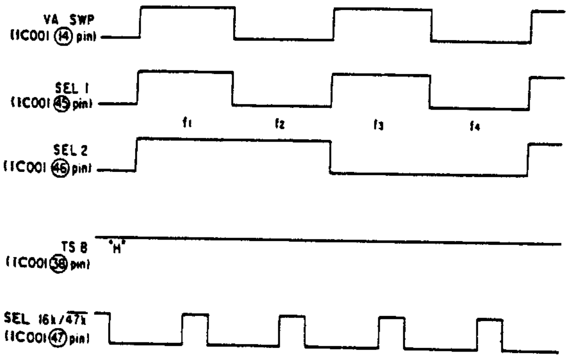
3-11-1. TIMING CHART 1 (PB, EDIT CUE)


VA SWP
(IC001 ⑭ pin)
SEL 1
(IC001 ㊺ pin)
SEL 2
(IC001 ㊻ pin)
TS 8
(IC001 ㊳ pin)
SEL 16k/47k
(IC001 ㊼ pin)
f1
f2
f3
f4
f1
f4
f1
f2
f1
f2
f3
f2
f3
f4
f3
f4

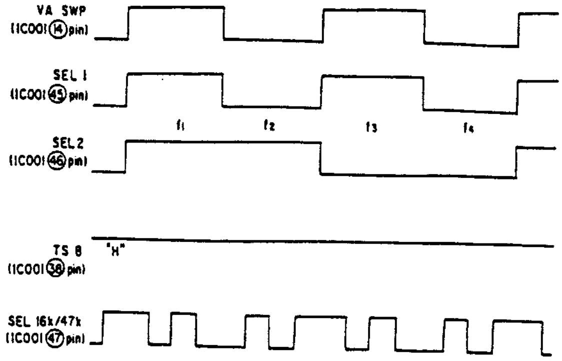
3-11-2. TIMING CHART 2 (EDIT REVIEW)


VA SWP
(IC001 ⑭ pin)
SEL 1
(IC001 ㊺ pin)
SEL 2
(IC001 ㊻ pin)
TS 8
(IC001 ㊳ pin)
SEL 16k/47k
(IC001 ㊼ pin)
f4
f3
f2
f1

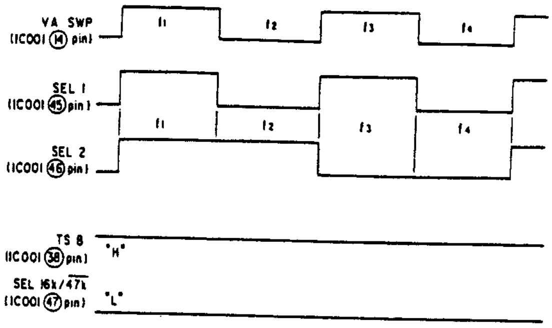
3-11-3. TIMING CHART 3 (CUE)


VA SWP
(IC001 ⑭ pin)
SEL 1
(IC001 ㊺ pin)
SEL 2
(IC001 ㊻ pin)
TS 8
(IC001 ㊳ pin)
"H"
SEL 16k/47k
(IC001 ㊼ pin)
f1
f2
f3
f4

3-11-4. TIMING CHART 4 (REVIEW)


VA SWP
(IC001 ⑭ pin)
SEL 1
(IC001 ㊺ pin)
SEL 2
(IC001 ㊻ pin)
TS 8
(IC001 ㊳ pin)
"H"
SEL 16k/47k
(IC001 ㊼ pin)
f1
f2
f3
f4

3-11-5. TIMING CHART 5 (REC)


VA SWP
(IC001 ⑭ pin)
SEL 1
(IC001 ㊺ pin)
SEL 2
(IC001 ㊻ pin)
TS 8
(IC001 ㊳ pin)
"H"
SEL 16k/47k
(IC001 ㊼ pin)
"L"
f1
f2
f3
f4
f1
f2
f3
f4

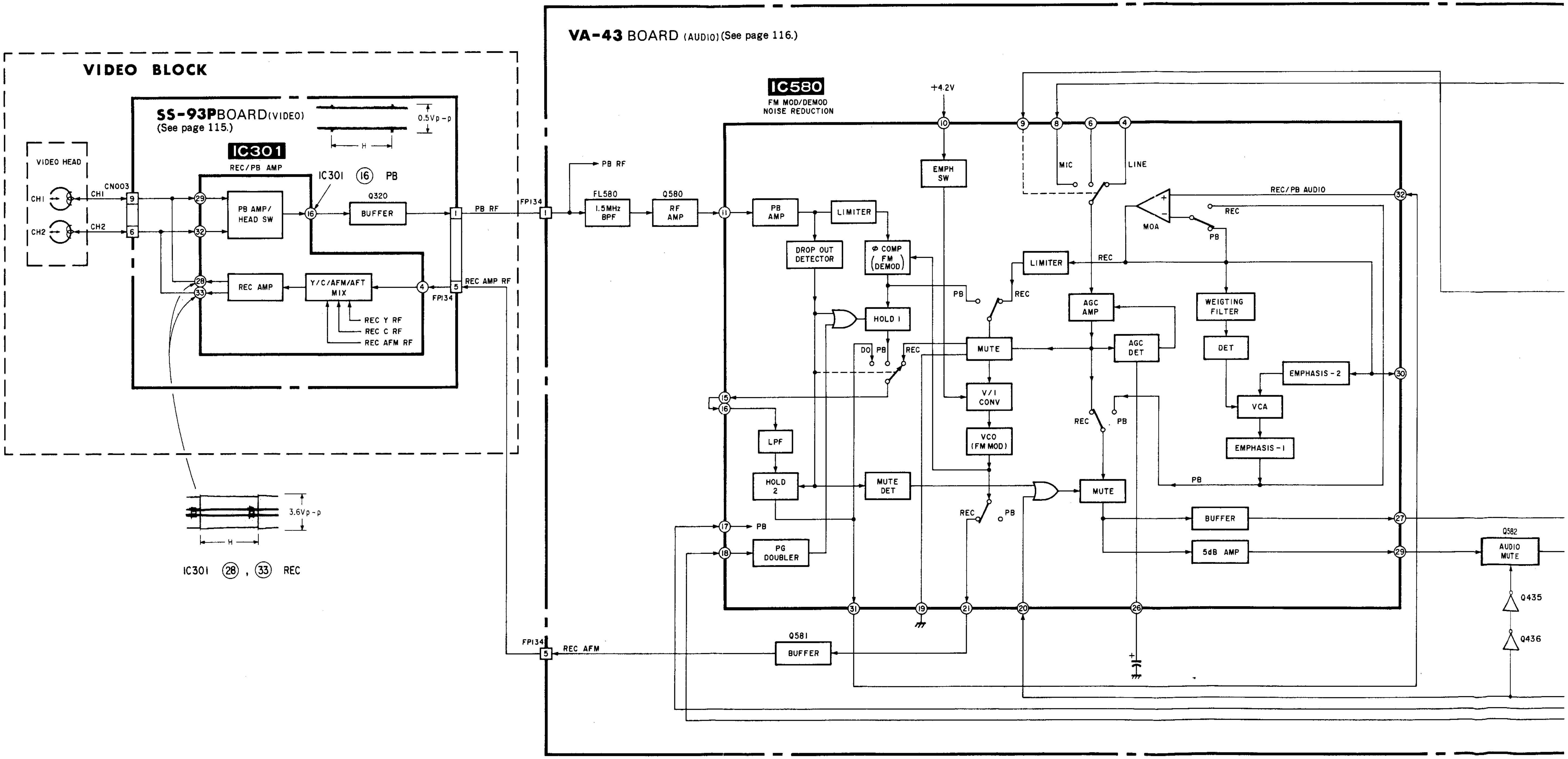
3-12. SYSTEM CONTROL—PERIPHERAL CIRCUIT INTERFACE

Signal	I/O	Pin No.	Input/Output Level
DEW	I	SS-93P board IC001①	Dew sensor input. Input voltage increases when there is dew.
VA REF	I	SS-93P board IC001④	Reference voltage input (5V DC) for A-D conversion of pin ① (DEW), pin ② (ATF ERR) and pin ③ (SWP DLY) input analog voltage (0-5V DC).
CLK	I	SS-93P board IC001⑦	Clock input from serial data transmission mode control (FD-6P board IC151). V cycle "L" pulse ( ) in VTR mode.
DATA TO MASTER	O	SS-93P board IC001⑧	Serial data output to mode control. V cycle "L" pulse ( ) in VTR mode.
DATA TO SLAVE	I	SS-93P board IC001⑨	Serial data input from mode control. V cycle "L" pulse ( ) in VTR mode.
$\overline{\text{END SENS}}$	I	SS-93P board IC001⑲	TAPE END sensor (SS-93P board PH001) input. "L" pulse input at tape end. Normally "H".
$\overline{\text{TOP SENS}}$	I	SS-93P board IC001㉑	TAPE TOP sensor (SS-93P board PH002) input. "L" pulse input at tape top. Normally "H".
$\overline{\text{CS}}$	I	SS-93P board IC001㉒	Serial signal Chip select signal input from mode control. V cycle pulse. ( )
$\overline{\text{SLAVE RESET}}$	I	SS-93P board IC001㉓	Reset signal input from mode control. Goes "L" when power is turned ON/OFF and servo/mechanism control (SS-93P board IC001) is reset.
$\overline{\text{T/E LED}}$	O	SS-93P board IC001㉛	Pulse output ( ) for lighting up T/E SENS LED (FP-53 board D302). REC/PB 100msec cycle. CUE/REVIEW 17msec cycle. FF/REW "L" when LED is lit up. REC/PB 100msec cycle. CUE/REVIEW 17msec cycle. FF/REW 3msec cycle.
VTR POWER	O	SS-93P board IC001㉟	VTR power ON/OFF signal output. "H" during VTR mode and CAMERA mode. Operates DC-DC converter, and generates VTR 5V.
CAM POWER	O	SS-93P board IC001㊱	Camera power ON/OFF signal output. "H" during CAMERA mode. Operates DC-DC converter and generates voltages used for camera.
LOAD	O	SS-93P board IC001㊶	"H" during cassette loading.
UNLOAD	O	SS-93P board IC001㊷	"H" during cassette eject.
$\overline{\text{REC PROOF}}$	I	SS-93P board IC001㊾	"H" when cassette which can not be recorded (erase prevention) is inserted.
M SW1	I	SS-93P board IC001㊿	Mode switch input for mechanism. Indicates mechanism position.
M SW2	I	SS-93P board IC001(51)	
M SW3	I	SS-93P board IC001(52)	

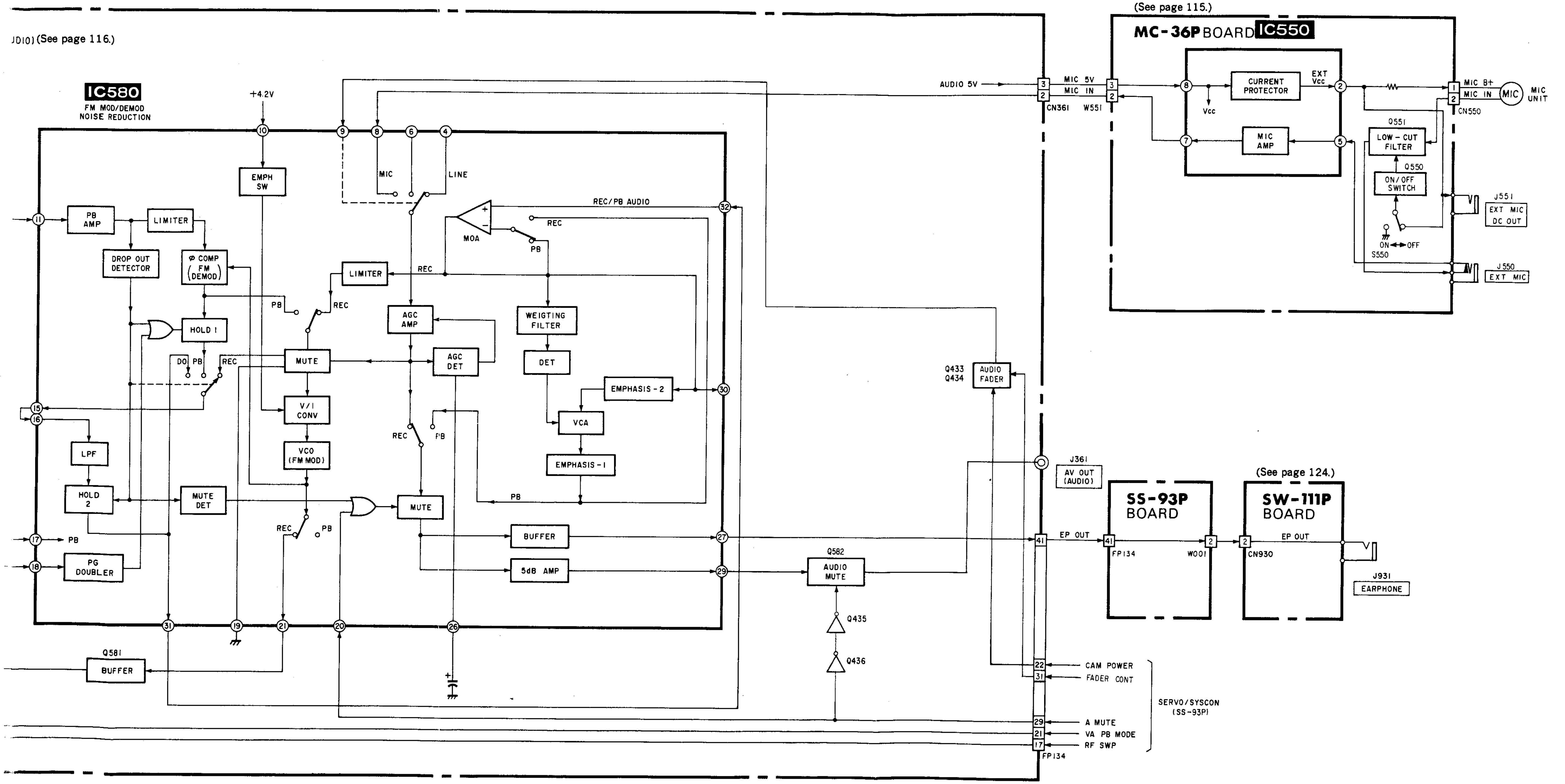
Mechanism position	READY	REC/PB/ CUE/REV/FF/REW	GL	STOP	EJECT	Mid-position
M SW1	L	H	H	H	L	H
M SW2	H	H	L	L	L	H
M SW3	H	L	L	H	H	H

Signal	I/O	Pin No.	Input/Output Level
V SO	O	SS-93P board IC001(53)	Video serial data output.
BATTERY LEVEL	I	SS-93P board IC001(62)	Main battery voltage level detection input.
T REEL FG	I	SS-93P board IC001(63)	T REEL FG (FP-53 board D304) input. Pulse corresponds to S reel rotation.
S REEL FG	I	SS-93P board IC001(64)	S REEL FG (FP-53 board D303) input. Pulse corresponds to S reel rotation.

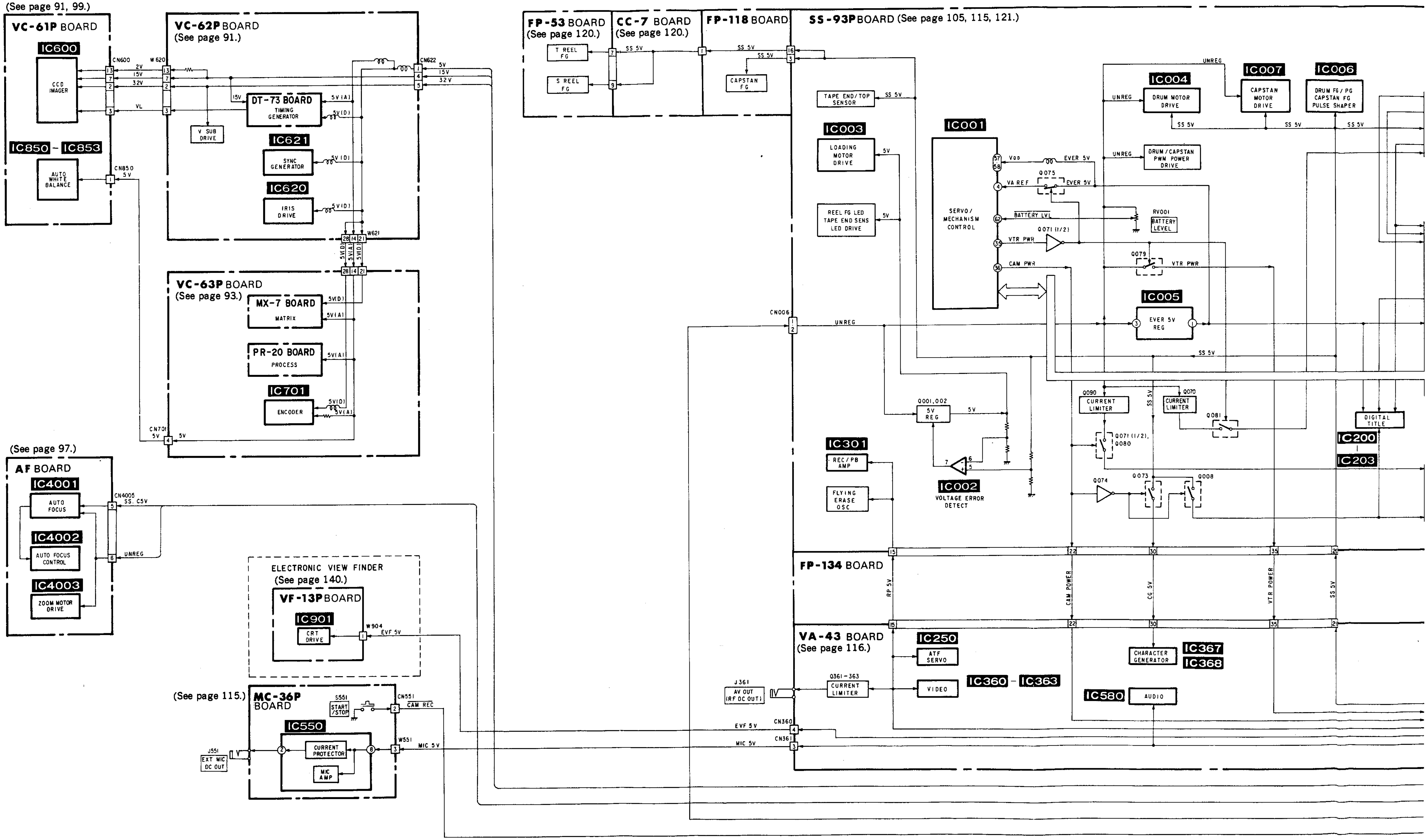
3-13. AUDIO BLOCK DIAGRAM

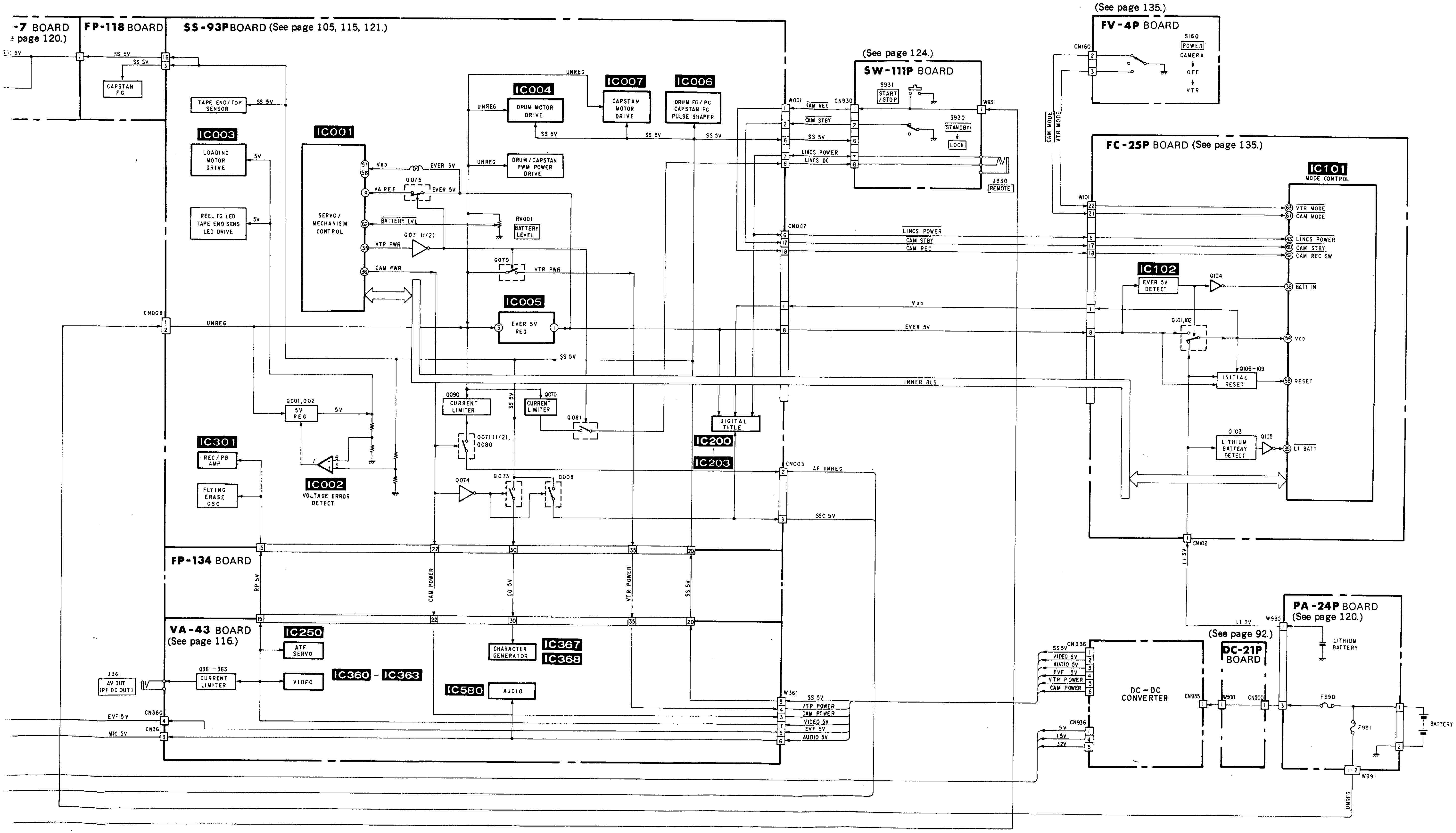


VIDEO BLOCK
SS-93PBOARD(VIDEO)
(See page 115.)
IC301
REC/PB AMP
VIDEO HEAD
CH1
CH2
CN003
PB AMP/
HEAD SW
IC301 ⑯ PB
Q320
BUFFER
REC AMP
Y/C/AFM/AFT
MIX
REC Y RF
REC C RF
REC AFM RF
0.5Vp-p
H
PB RF
REC AMP RF
FP134
3.6Vp-p
IC301 ㉘ , ㉝ REC
VA-43 BOARD (AUDIO)(See page 116.)
IC580
FM MOD/DEMOD
NOISE REDUCTION
+4.2V
FL580
1.5MHz
BPF
Q580
RF
AMP
PB
AMP
LIMITER
DROP OUT
DETECTOR
φ COMP
(FM
DEMOD)
HOLD 1
EMPH
SW
MIC
LINE
REC/PB AUDIO
MOA
REC
PB
LIMITER
AGC
AMP
AGC
DET
WEIGTING
FILTER
DET
EMPHASIS - 2
VCA
EMPHASIS - 1
MUTE
DO
V/I
CONV
VCO
(FM MOD)
LPF
HOLD
2
MUTE
DET
PG
DOUBLER
BUFFER
5dB AMP
Q582
AUDIO
MUTE
Q435
Q436
Q581
REC AFM


JD10) (See page 116.)
IC580
FM MOD/DEMOD
NOISE REDUCTION
+4.2V
EMPH SW
PB AMP
LIMITER
DROP OUT DETECTOR
φ COMP (FM DEMOD)
HOLD 1
DO
PB
REC
MUTE
V/I CONV
VCO (FM MOD)
LPF
HOLD 2
MUTE DET
PG DOUBLER
PB
MIC
LINE
MOA
REC/PB AUDIO
LIMITER
AGC AMP
AGC DET
WEIGTING FILTER
DET
EMPHASIS-2
VCA
EMPHASIS-1
MUTE
BUFFER
5dB AMP
Q581
BUFFER
Q582
AUDIO MUTE
Q435
Q436
Q433
Q434
AUDIO FADER
AUDIO 5V
MIC 5V
MIC IN
CN361
W551
(See page 115.)
MC-36P BOARD IC550
CURRENT PROTECTOR
EXT Vcc
Vcc
MIC AMP
Q551
LOW-CUT FILTER
Q550
ON/OFF SWITCH
ON ◄► OFF
S550
MIC B+
MIC IN
MIC
MIC UNIT
CN550
J551
EXT MIC DC OUT
J550
EXT MIC
J361
AV OUT (AUDIO)
EP OUT
SS-93P BOARD
FP134
W001
(See page 124.)
SW-111P BOARD
CN930
EP OUT
J931
EARPHONE
CAM POWER
FADER CONT
A MUTE
VA PB MODE
RF SWP
SERVO/SYSCON (SS-93P)
FP134

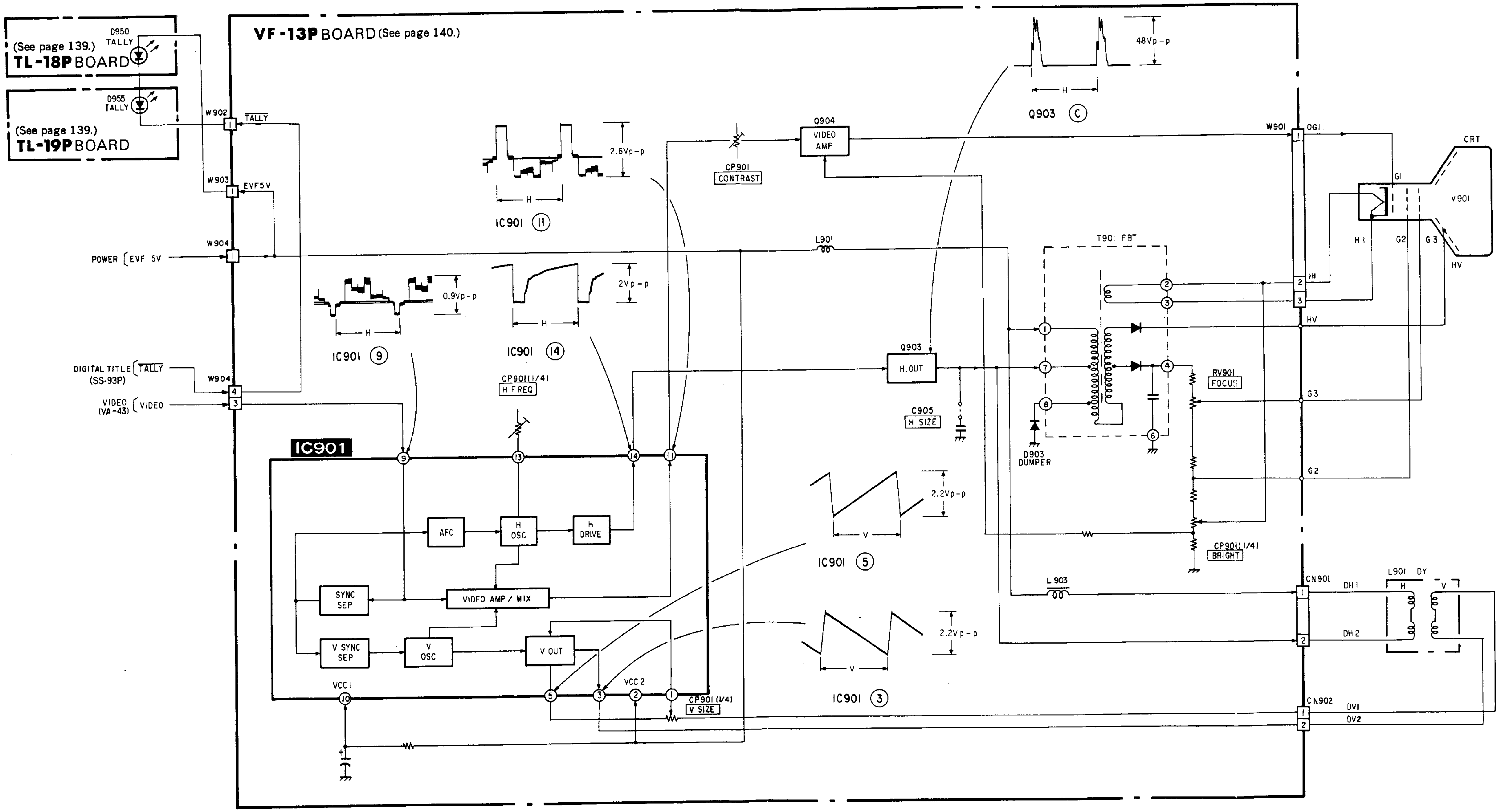
3-14. POWER SUPPLY BLOCK DIAGRAM


(See page 91, 99.)
VC-61P BOARD
IC600
CCD IMAGER
IC850 - IC853
AUTO WHITE BALANCE
CN600
CN850 5V
VC-62P BOARD
(See page 91.)
W620
2V
15V
32V
VL
V SUB DRIVE
DT-73 BOARD
TIMING GENERATOR
5V(A)
5V(D)
IC621
SYNC GENERATOR
IC620
IRIS DRIVE
CN622
W621
VC-63P BOARD
(See page 93.)
MX-7 BOARD
MATRIX
PR-20 BOARD
PROCESS
IC701
ENCODER
CN701 5V
(See page 97.)
AF BOARD
IC4001
AUTO FOCUS
IC4002
AUTO FOCUS CONTROL
IC4003
ZOOM MOTOR DRIVE
CN4005
SS. C5V
UNREG
ELECTRONIC VIEW FINDER
(See page 140.)
VF-13P BOARD
IC901
CRT DRIVE
W904
EVF 5V
(See page 115.)
MC-36P BOARD
S551
START /STOP
IC550
CURRENT PROTECTOR
MIC AMP
J551
EXT MIC DC OUT
CN551
CAM REC
W551
MIC 5V
FP-53 BOARD
(See page 120.)
T REEL FG
S REEL FG
CC-7 BOARD
(See page 120.)
SS 5V
FP-118 BOARD
CAPSTAN FG
SS-93P BOARD (See page 105, 115, 121.)
TAPE END/TOP SENSOR
IC003
LOADING MOTOR DRIVE
REEL FG LED TAPE END SENS LED DRIVE
IC001
SERVO/ MECHANISM CONTROL
VDD
EVER 5V
VA REF
Q075
BATTERY LVL
Q071 (1/2)
VTR PWR
CAM PWR
IC004
DRUM MOTOR DRIVE
IC007
CAPSTAN MOTOR DRIVE
IC006
DRUM FG/PG CAPSTAN FG PULSE SHAPER
DRUM/CAPSTAN PWM POWER DRIVE
RV001
BATTERY LEVEL
Q079
IC005
EVER 5V REG
CN006
Q001,002
5V REG
IC002
VOLTAGE ERROR DETECT
IC301
REC/PB AMP
FLYING ERASE OSC
Q090
CURRENT LIMITER
Q070
CURRENT LIMITER
Q071 (1/2), Q080
Q081
Q074
Q073
Q008
DIGITAL TITLE
IC200 | IC203
FP-134 BOARD
RP 5V
CAM POWER
CG 5V
VTR POWER
SS 5V
VA-43 BOARD
(See page 116.)
IC250
ATF SERVO
VIDEO
IC360 - IC363
CHARACTER GENERATOR
IC367
IC368
IC580
AUDIO
Q361-363
CURRENT LIMITER
J361
AV OUT (RF DC OUT)
CN360
CN361
EVF 5V
MIC 5V



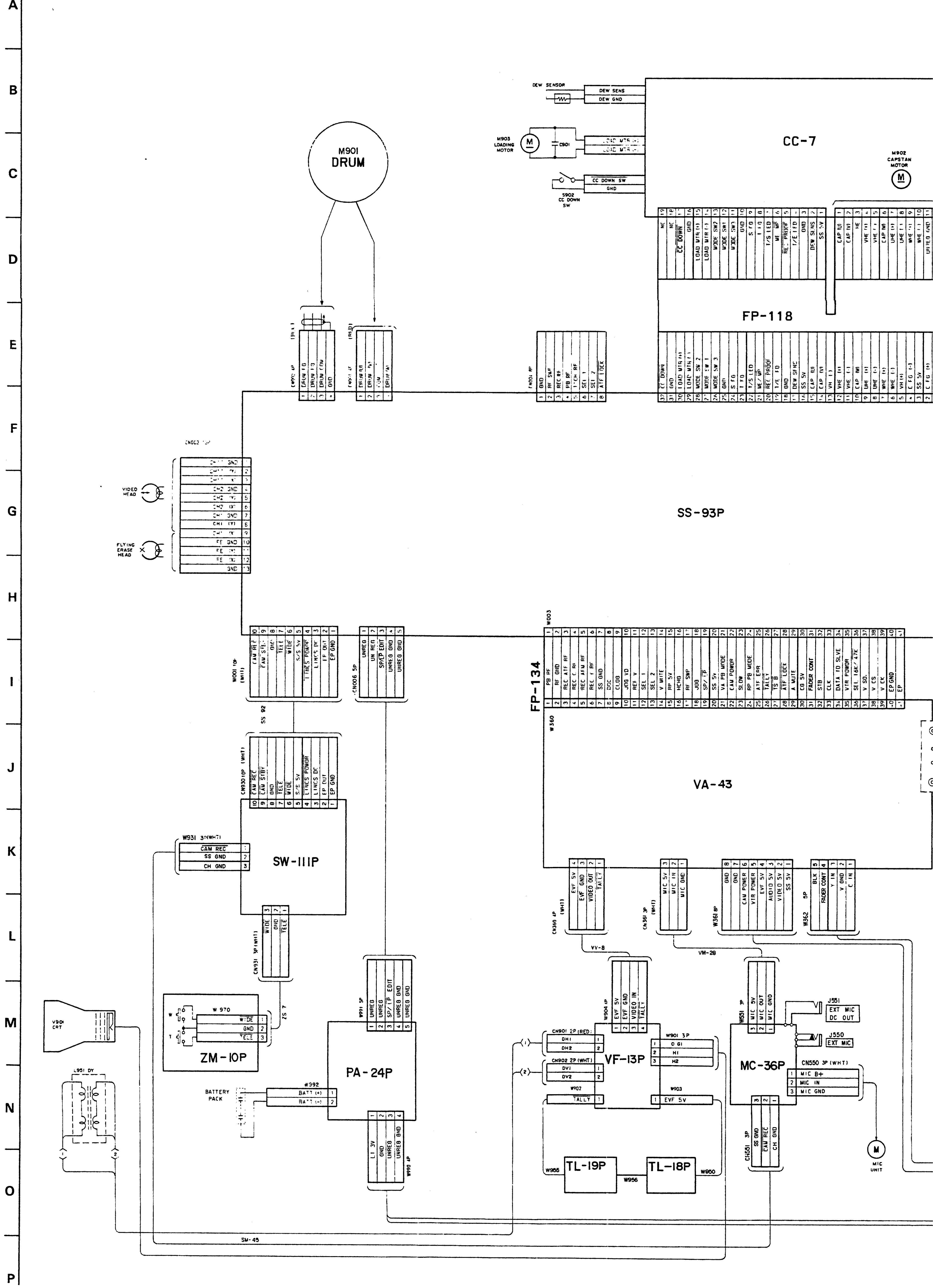
-7 BOARD
page 120.)
FP-118 BOARD
CAPSTAN FG
SS-93P BOARD (See page 105, 115, 121.)
TAPE END/TOP SENSOR
SS 5V
IC003
LOADING MOTOR DRIVE
REEL FG LED TAPE END SENS LED DRIVE
IC001
SERVO/ MECHANISM CONTROL
VDD
EVER 5V
Q075
VA REF
BATTERY LVL
RV001
BATTERY LEVEL
Q071 (1/2)
VTR PWR
CAM PWR
Q079
IC004
DRUM MOTOR DRIVE
DRUM/CAPSTAN PWM POWER DRIVE
UNREG
IC007
CAPSTAN MOTOR DRIVE
IC006
DRUM FG/PG CAPSTAN FG PULSE SHAPER
IC005
EVER 5V REG
CN006
UNREG
Q001,002
5V REG
IC002
VOLTAGE ERROR DETECT
Q090
CURRENT LIMITER
Q070
CURRENT LIMITER
Q081
Q071 (1/2), Q080
Q074
Q073
Q008
DIGITAL TITLE
IC200
IC203
IC301
REC/PB AMP
FLYING ERASE OSC
CN005
AF UNREG
SSC 5V
FP-134 BOARD
RP 5V
CAM POWER
CG 5V
VTR POWER
SS 5V
VA-43 BOARD
(See page 116.)
IC250
ATF SERVO
Q361-363
CURRENT LIMITER
VIDEO
IC360 - IC363
CHARACTER GENERATOR
IC367
IC368
IC580
AUDIO
J361
AV OUT (RF DC OUT)
EVF 5V
MIC 5V
CN360
CN361
W361
SS 5V
VTR POWER
CAM POWER
VIDEO 5V
EVF 5V
AUDIO 5V
CN007
LINCS POWER
CAM STBY
CAM REC
INNER BUS
W001
(See page 124.)
SW-111P BOARD
S931
START /STOP
CN930
S930
STANDBY
LOCK
W931
J930
REMOTE
CAM REC
CAM STBY
LINCS POWER
LINCS DC
(See page 135.)
FV-4P BOARD
CN160
S160
POWER
CAMERA
OFF
VTR
CAM MODE
VTR MODE
FC-25P BOARD (See page 135.)
IC101
MODE CONTROL
W101
VTR MODE
CAM MODE
LINCS POWER
CAM STBY
CAM REC SW
IC102
EVER 5V DETECT
Q104
BATT IN
Q101,102
VDD
Q106-109
INITIAL RESET
RESET
Q103
LITHIUM BATTERY DETECT
Q105
LI BATT
CN102
LI 3V
PA-24P BOARD
(See page 120.)
W990
LITHIUM BATTERY
F990
F991
BATTERY
W991
UNREG
(See page 92.)
DC-21P BOARD
W500
CN500
CN935
DC-DC CONVERTER
CN936
SS 5V
VIDEO 5V
AUDIO 5V
EVF 5V
VTR POWER
CAM POWER
5V
15V
32V

3-15. VIEWFINDER BLOCK DIAGRAM

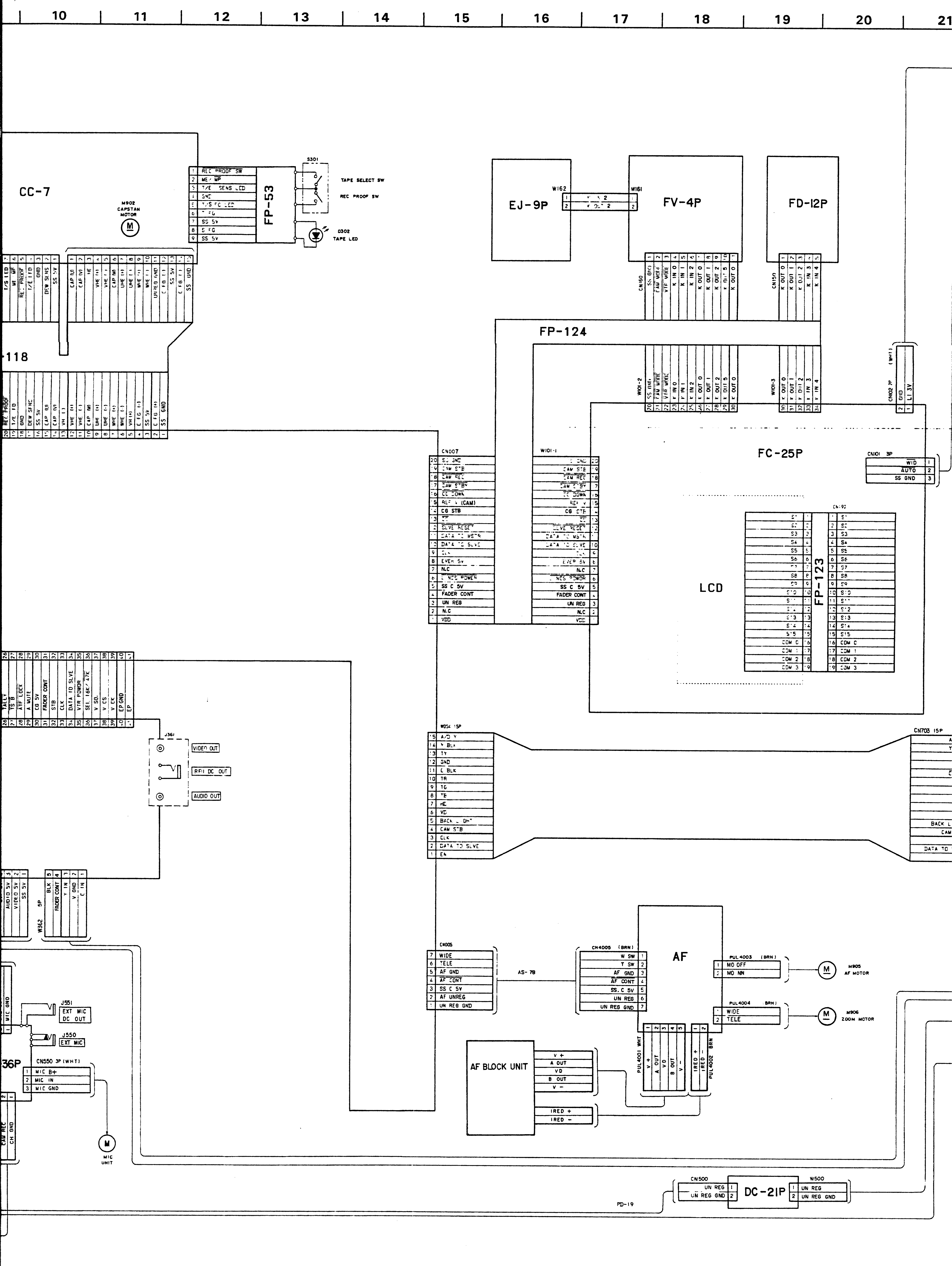

(See page 139.)
TL-18P BOARD
D950
TALLY
D955
TALLY
(See page 139.)
TL-19P BOARD
VF-13P BOARD (See page 140.)
W902
TALLY
W903
EVF5V
W904
POWER EVF 5V
DIGITAL TITLE (SS-93P) TALLY
VIDEO (VA-43) VIDEO
2.6Vp-p
H
IC901 ⑪
0.9Vp-p
IC901 ⑨
2Vp-p
IC901 ⑭
CP901(1/4)
H FREQ
CP901
CONTRAST
Q904
VIDEO AMP
48Vp-p
Q903 Ⓒ
L901
Q903
H.OUT
C905
H SIZE
D903
DUMPER
T901 FBT
RV901
FOCUS
CP901(1/4)
BRIGHT
W901
OG1
H1
HV
G3
G2
CRT
V901
G1
CN901
DH1
DH2
L901 DY
H
V
CN902
DV1
DV2
L903
IC901
AFC
H OSC
H DRIVE
SYNC SEP
VIDEO AMP / MIX
V SYNC SEP
V OSC
V OUT
VCC1
VCC2
CP901(1/4)
V SIZE
2.2Vp-p
IC901 ⑤
2.2Vp-p
IC901 ③

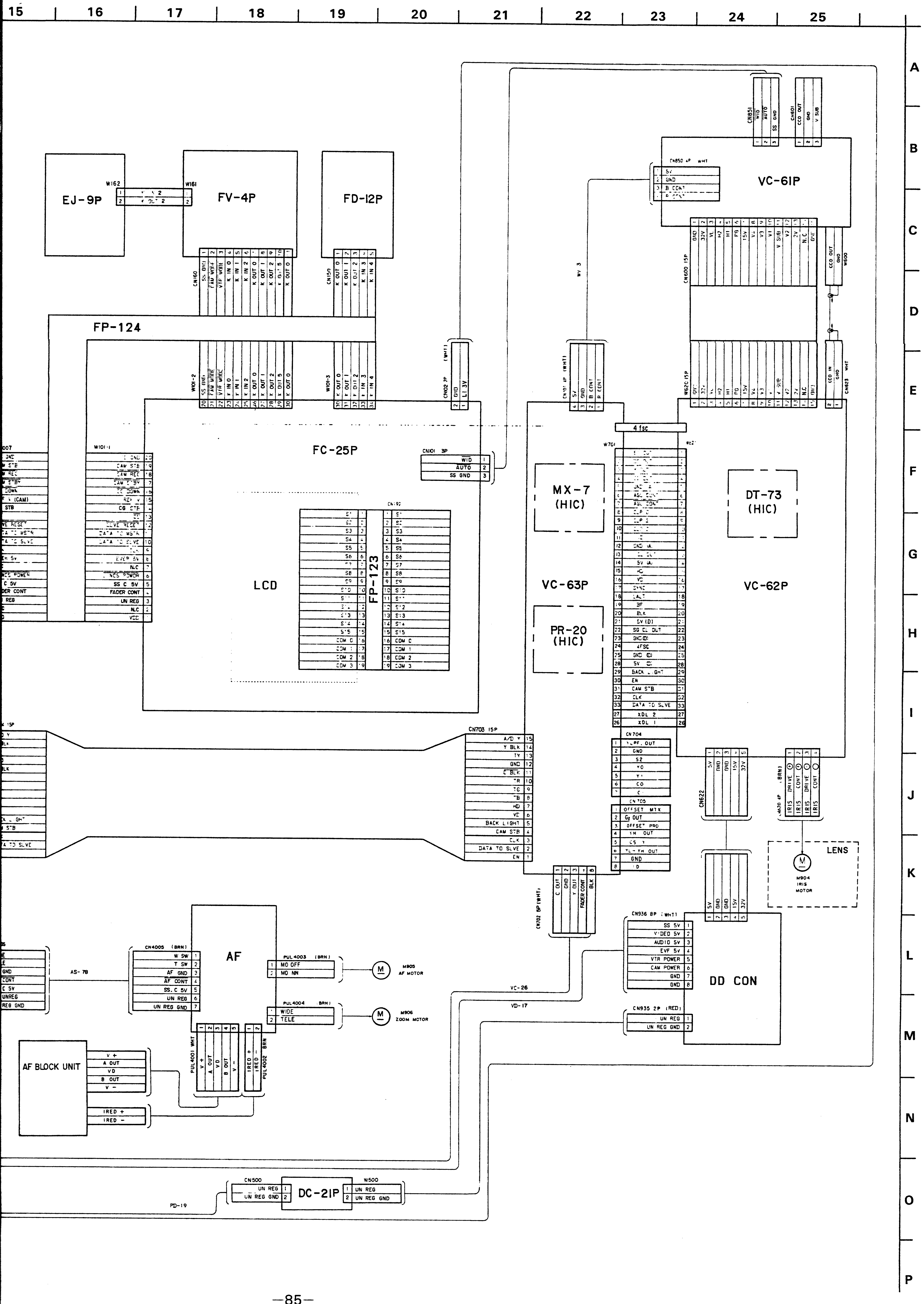
SECTION 4
PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

4-1. FRAME SCHEMATIC DIAGRAM



1
2
3
4
5
6
7
8
9
10
11
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
M901
DRUM
DEW SENSOR
DEW SENS
DEW GND
M903
LOADING
MOTOR
C901
S902
CC DOWN
SW
CC DOWN SW
GND
CC-7
M902
CAPSTAN
MOTOR
FP-118
SS-93P
VIDEO HEAD
FLYING ERASE HEAD
FP-134
W003
W360
VA-43
SS 92
W001 10P (WHT)
CN006 5P
CN930 10P (WHT)
CAM REC
CAM STBY
GND
TELE
WIDE
S/S 5V
LINES POWER
LINES DC
EP OUT
EP GND
UNREG
UN REG
SP/EP EDIT
UNREG GND
W931 3P(WHT)
SS GND
CH GND
SW-111P
CN931 3P (WHT)
ZS 7
W 970
ZM-10P
V901
CRT
L951 DY
W991 5P
PA-24P
W392
BATTERY PACK
BATT (+)
BATT (-)
W990 4P
LI 3V
CN360 4P (WHT)
EVF 5V
EVF GND
VIDEO OUT
TALLY
CN361 3P (WHT)
MIC 5V
MIC IN
MIC GND
W361 8P
CAM POWER
VTR POWER
AUDIO 5V
VIDEO 5V
SS 5V
W362 5P
BLK
FADER CONT
Y IN
C IN
VV-8
VM-28
W904 4P
VIDEO IN
CN901 2P (RED)
DH1
DH2
CN902 2P (WHT)
DV1
DV2
W902
VF-13P
W901 3P
O G1
H1
H2
W903
W551 3P
MIC OUT
J551
EXT MIC
DC OUT
J550
EXT MIC
MC-36P
CN550 3P (WHT)
MIC B+
CN551 3P
MIC UNIT
TL-19P
TL-18P
W955
W956
W950
SM-45

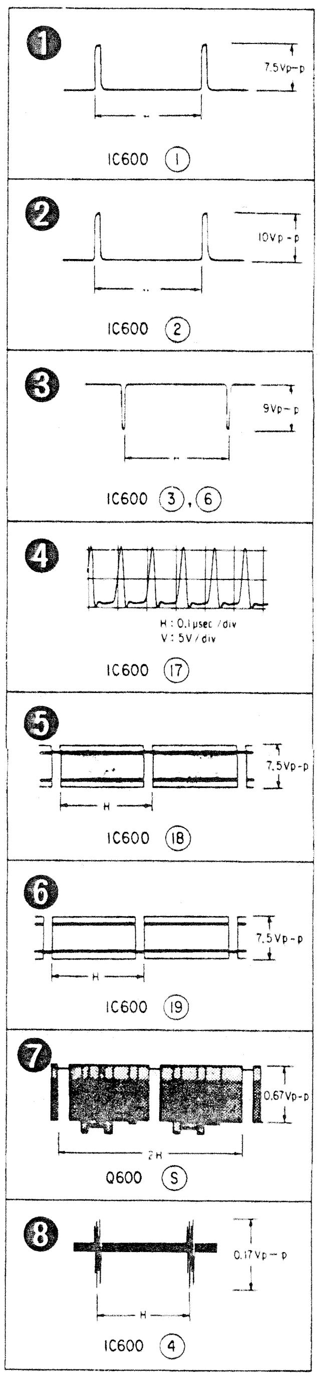

10
11
12
13
14
15
16
17
18
19
20
21
CC-7
M902 CAPSTAN MOTOR
FP-53
REC PROOF SW
ME/MP
T/E SENS LED
GND
T/S FG LED
SS 5V
S301
TAPE SELECT SW
REC PROOF SW
D302 TAPE LED
EJ-9P
W162
W161
FV-4P
FD-12P
CN160
CN150
FP-124
W101-2
W101-3
CN102 2P
GND
LI 3V
-118
FC-25P
CN101 3P
WID
AUTO
SS GND
CN007
W101-1
SS GND
CAM STB
CAM REC
CAM STBY
CC DOWN
REF V (CAM)
CG STB
SLVE RESET
DATA TO MSTR
DATA TO SLVE
CLK
EVER 5V
N.C
LNCS POWER
SS C 5V
FADER CONT
UN REG
VDD
LCD
FP-123
CN192
COM C
COM 1
COM 2
COM 3
TALLY
TS B
ATF LOCK
A MUTE
CG 5V
STB
VTR POWOR
V CS
V CK
EP GND
EP
J361
VIDEO OUT
RFU DC OUT
AUDIO OUT
W034 15P
A/D Y
Y BLK
GND
C BLK
BACK LIGHT
CAM STB
CLK
DATA TO SLVE
CN703 15P
AUDIO 5V
VIDEO 5V
SS 5V
W362
5P
BLK
FADER CONT
Y IN
V GND
C IN
CN005
WIDE
TELE
AF GND
AF CONT
SS C 5V
AF UNREG
UN REG GND
AS-78
CN4005 (BRN)
W SW
T SW
AF GND
AF CONT
SS. C 5V
UN REG
UN REG GND
AF
PUL4003 (BRN)
MO OFF
MO NN
M905 AF MOTOR
PUL4004 (BRN)
WIDE
TELE
M906 ZOOM MOTOR
AF BLOCK UNIT
V +
A OUT
VD
B OUT
V −
IRED +
IRED −
PUL4001 WHT
PUL4002 BRN
J551
EXT MIC DC OUT
J550
EXT MIC
36P
CN550 3P (WHT)
MIC B+
MIC IN
MIC GND
MIC GND
MIC UNIT
CN500
UN REG
UN REG GND
DC-21P
W500
UN REG
UN REG GND
PD-19



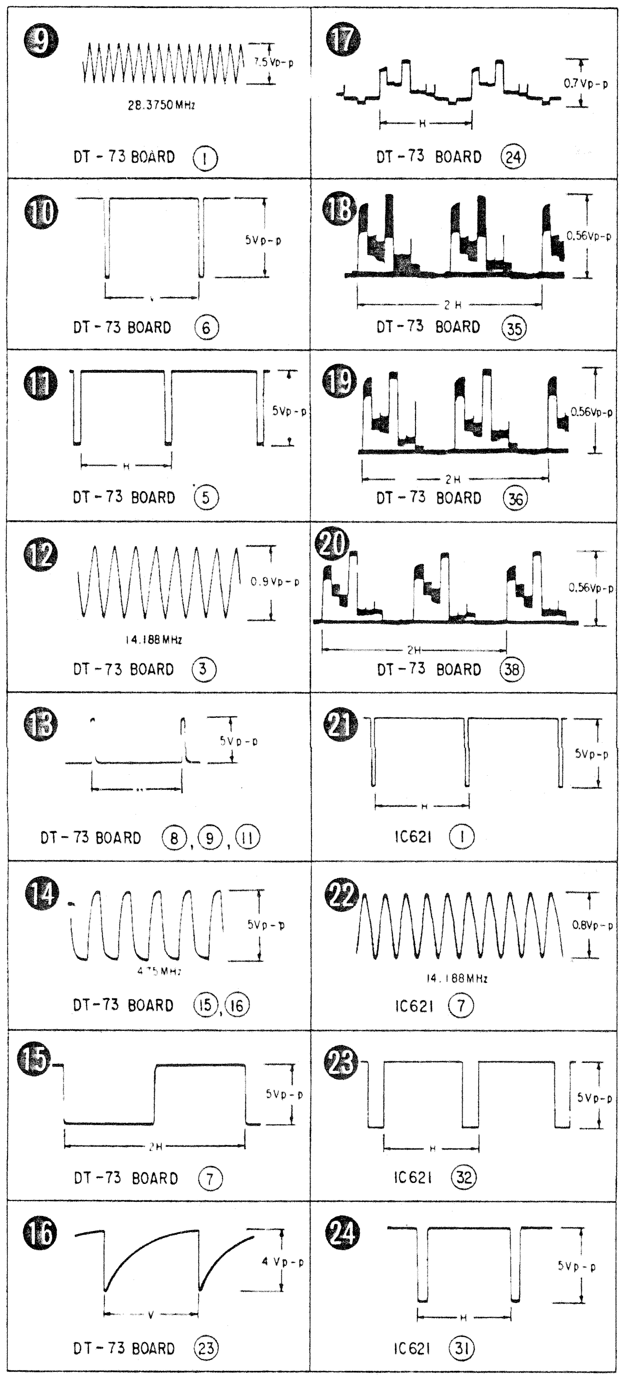
15
16
17
18
19
20
21
22
23
24
25
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
EJ-9P
W162
W161
FV-4P
FD-12P
CN160
CN150
FP-124
W101-2
W101-3
CN102 2P (WHT)
GND
LI 3V
FC-25P
W101-1
CN101 3P
WID
AUTO
SS GND
LCD
FP-123
CN192
VC-61P
CN851
WID
AUTO
SS GND
CN601
CCD OUT
GND
V SUB
CN850 4P WHT
5V
GND
B CONT
R CONT
CN600 15P
W600
WV 3
CN701 4P (WHT)
5V
GND
B CONT
R CONT
W620 15P
CN623 WHT
CCD IN
GND
4 fsc
W701
W621
MX-7 (HIC)
PR-20 (HIC)
VC-63P
DT-73 (HIC)
VC-62P
CN704
CN705
CN703 15P
A/D Y
Y BLK
TY
GND
C BLK
TR
TC
TB
HD
VD
BACK LIGHT
CAM STB
CLK
DATA TO SLVE
EN
CN702 5P (WHT)
C OUT
GND
Y OUT
FADER CONT
BLK
CN622
5V
GND
GND
15V
32V
CN470 4P (BRN)
IRIS DRIVE ⊕
IRIS CONT ⊕
IRIS DRIVE ⊖
IRIS CONT ⊖
LENS
M904 IRIS MOTOR
CN936 8P (WHT)
SS 5V
VIDEO 5V
AUDIO 5V
EVF 5V
VTR POWER
CAM POWER
GND
GND
DD CON
CN935 2P (RED)
UN REG
UN REG GND
VC-26
VD-17
AS-78
CN4005 (BRN)
W SW
T SW
AF GND
AF CONT
SS. C 5V
UN REG
UN REG GND
AF
PUL4003 (BRN)
MO OFF
MO NN
M905 AF MOTOR
PUL4004 (BRN)
WIDE
TELE
M906 ZOOM MOTOR
PUL4001 WHT
V +
A OUT
VD
B OUT
V −
PUL4002 BRN
IRED +
IRED −
AF BLOCK UNIT
CN500
UN REG
UN REG GND
DC-21P
W500
PD-19

4-2. PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

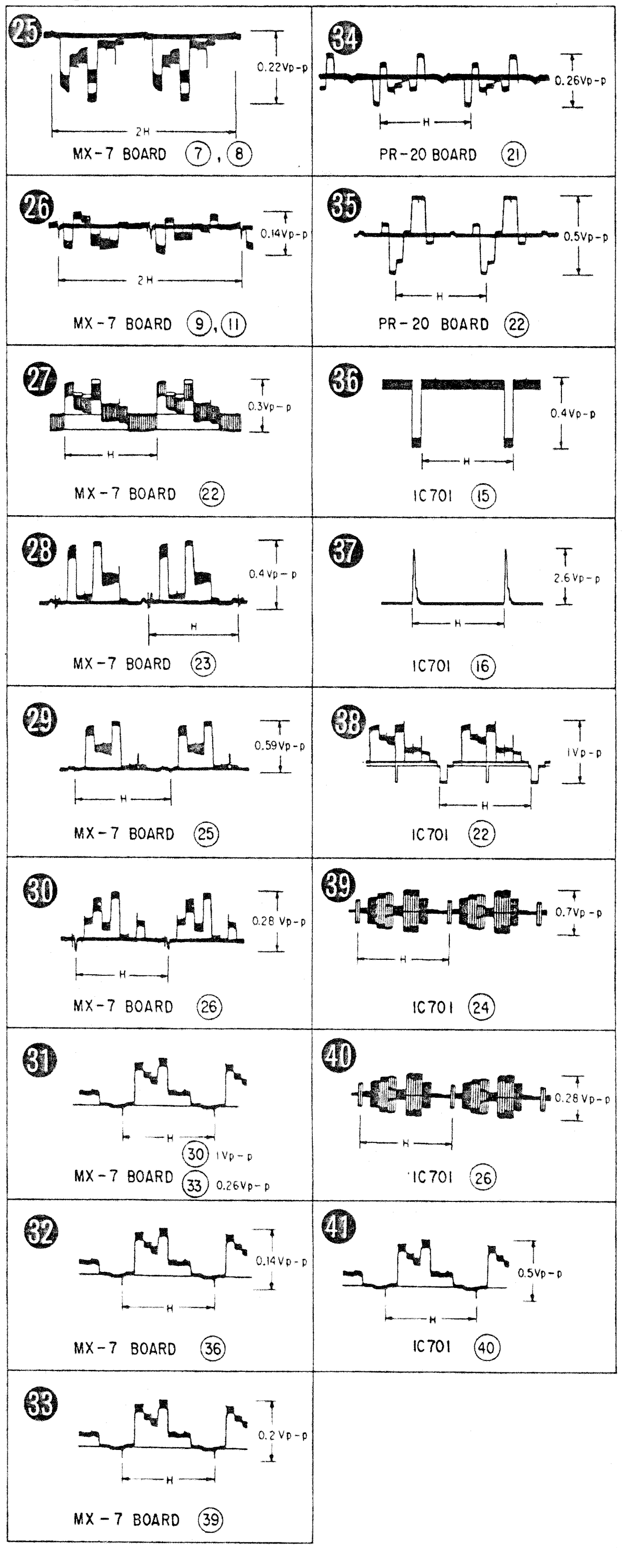
VC-61P BOARD



VC-62P BOARD



VC-63P BOARD



THIS NOTE IS COMMON FOR PRINTED WIRING B AND SCHEMATIC DIAGRAMS.

(In addition to this, the necessary note is printed in

- **For printed wiring boards.**
- ● : Through hole.
- ▨ : Pattern from the side which enables seeing.
- ▨ : Pattern of the rear side.
- Circled numbers refer to waveforms.

Caution:

Pattern face side: (Conductor Side)	Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Component Side)	Parts on the parts face side seen from the parts face are indicated.

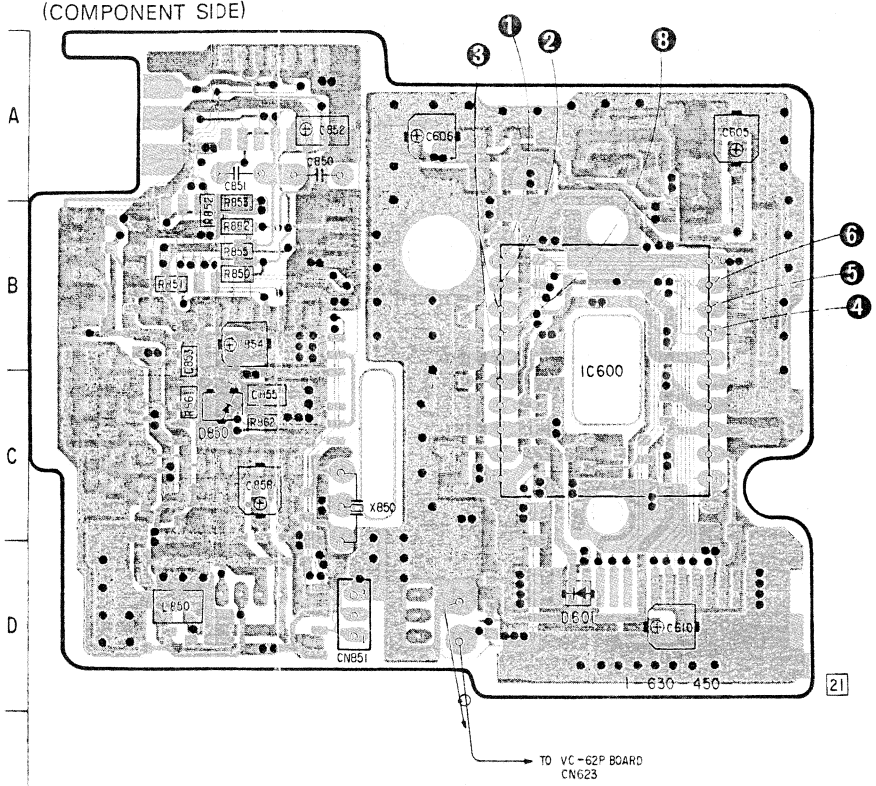
- **For schematic diagram.**
- Caution when replacing chip parts.
  New parts must be attached after removal of chip.
  Be careful not to heat the minus side of tantalum capacitor, because it is damaged by the heat.
- All resistors are in ohms, 1/10W unless otherwise noted.
  kΩ: 1000Ω, MΩ: 1000kΩ.
- All capacitors are in μF unless otherwise noted. pF : μμF.
  50V or less are not indicated except for electrolytics and tantalums.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.

VC-61P (CCD IMAGER), VC-62P (TIMING/SYNC GENERATOR), VC-63P (CAMER

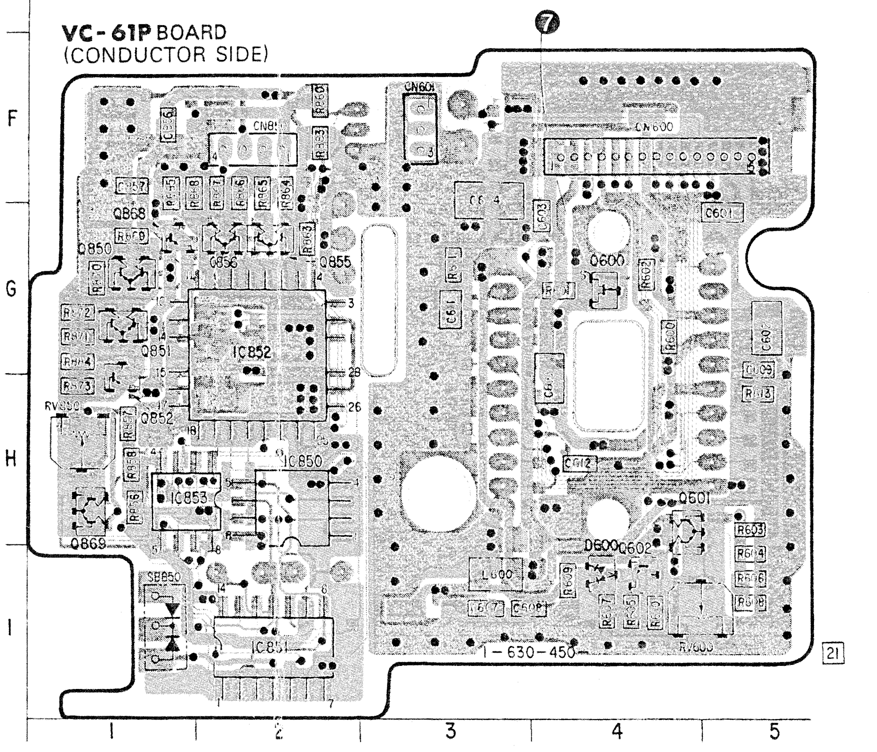
—Ref. No. VC-61P, VC-62P, VC-63P, DC-21P BOARDS ; 1,000 series—

D600	I-4
D601	D-4
D850	C-2
IC600	B-4
IC850	H-2
IC851	I-2
IC852	G-2
IC853	H-1
Q600	G-4
Q601	I-1
Q602	I-4
Q850	G-1
Q851	G-1
Q852	H-1
Q855	G-2
Q856	G-2
Q868	G-1
Q869	H-1

VC-61P BOARD
(COMPONENT SIDE)


A
B
C
D
E
❶ ❷ ❸ ❹ ❺ ❻ ❽
C852
C606
C605
C850
C851
R853
R852
R862
R855
R850
R851
IC600
D850
X850
D601
C610
CN851
1-630-450-
21
TO VC-62P BOARD CN623

VC-61P BOARD
(CONDUCTOR SIDE)


❼
F
G
H
I
1
2
3
4
5
CN601
CN600
CN851
Q868
Q850
Q856
Q855
Q600
Q851
IC852
Q852
IC850
IC853
Q869
IC851
SB850
RV850
Q601
D600
Q602
C601
R603
RV600
1-630-450-
21

INTED WIRING BOARDS

note is printed in each block.)

eing.

side seen from
ted.
side seen from
d.

of chip.
f tantalum capacitor,

therwise noted.

ted. pF : $\mu\mu$F.
lectrolytics and

characteristic curve B.

- : nonflammable resistor.
- : fusible resistor.
- : panel designation.
- △ : internal component.
- : adjustment for repair.
- : B + Line
- : IN/OUT direction of (+, –) B line.
- Circled numbers refer to waveforms.

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

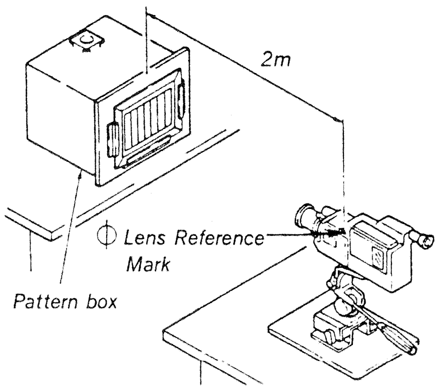
When indicating parts by reference number, please include the board name.

- **For voltage and waveforms.**

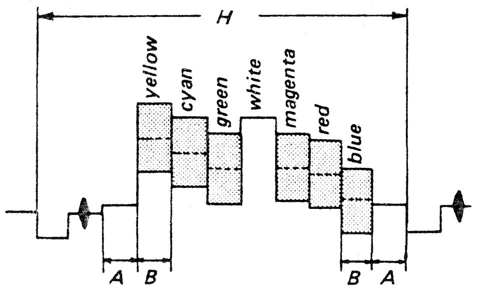
CAMERA (1), CAMERA (2), AUTO FOCUS, DIGITAL TITLER BLOCKS

- Voltage and waveform measuring conditions:
  - (1) Sample object: Pattern box color bars.
  - (2) Voltage values: Relative to ground, measured with a DC digital multimeter (impedance 10M-ohm or more).

1. Connection


2m
Lens Reference Mark
Pattern box

2. Adjust the zooming of camera and the tripod so th the output waveform of Fig. a and the picture of Fig. can be obtain.


H
yellow
cyan
green
white
magenta
red
blue
A
B
B
A

A = B

Fig. a Camera output waveform of J361 on VA-43 board

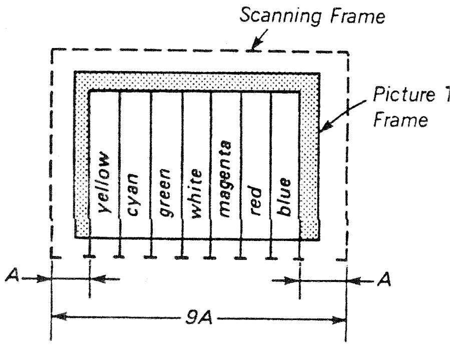
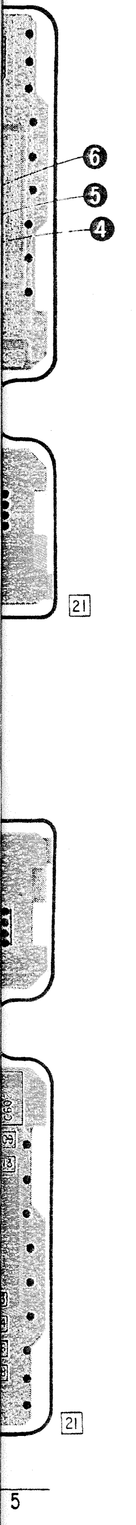
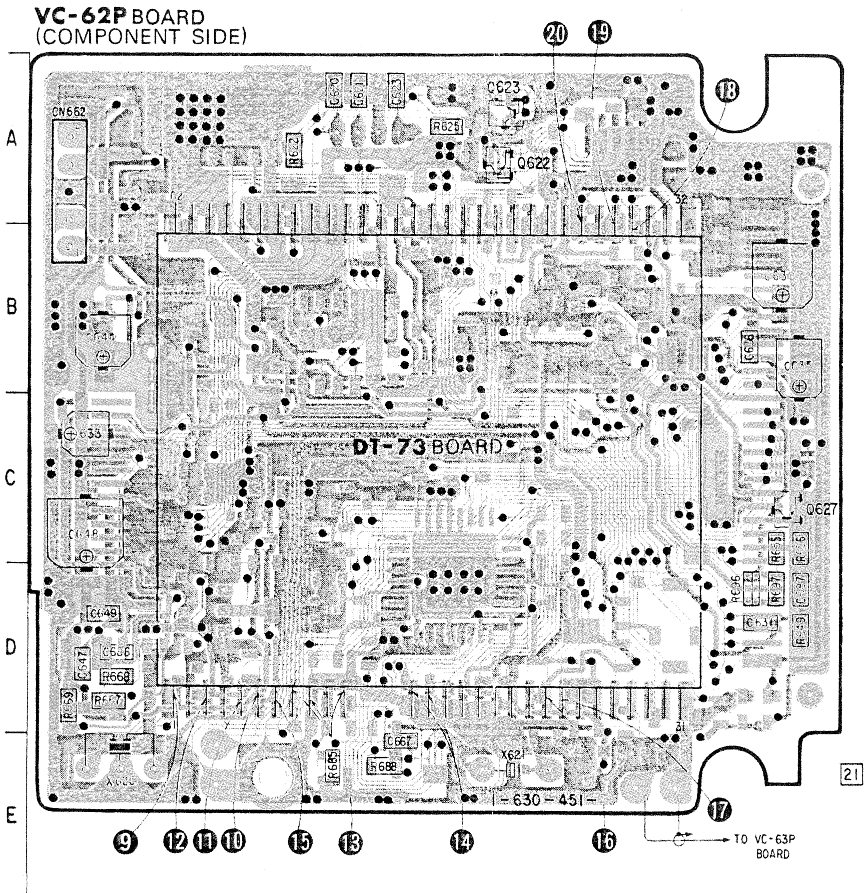

Scanning Frame
Picture
Frame
yellow
cyan
green
white
magenta
red
blue
A
A
9A

Fig. b Picture of TV monitor screen

, VC-63P (CAMERA MATRIX, CAMERA ENCORDER, TITLEMIX), DC-21P (RELAY) PRINTED WIRING BOARDS

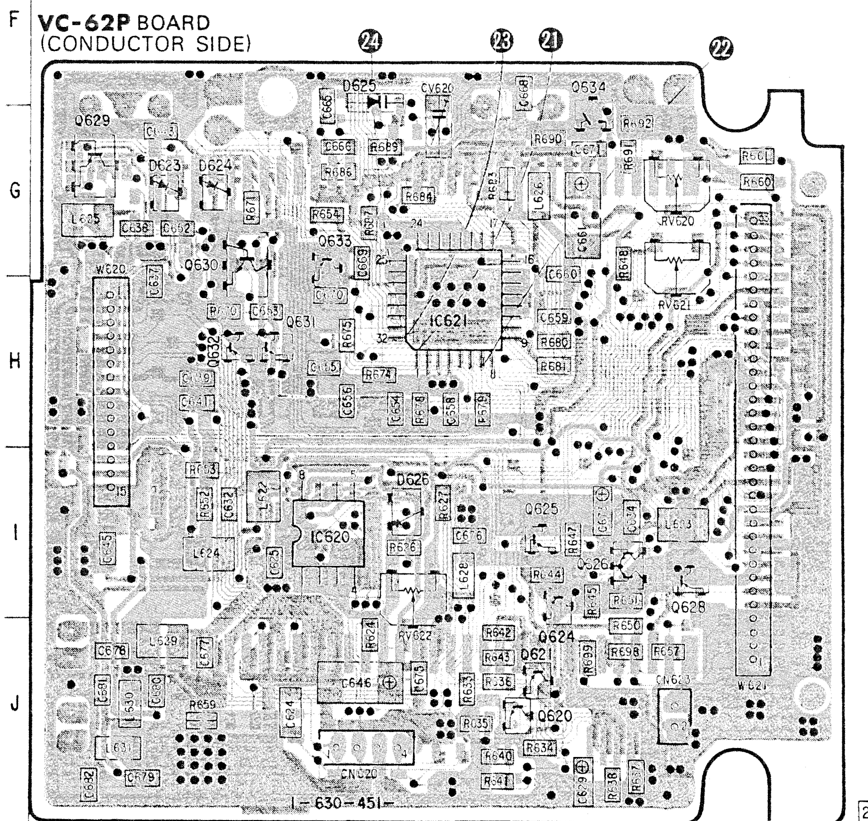


VC-62P BOARD
(COMPONENT SIDE)

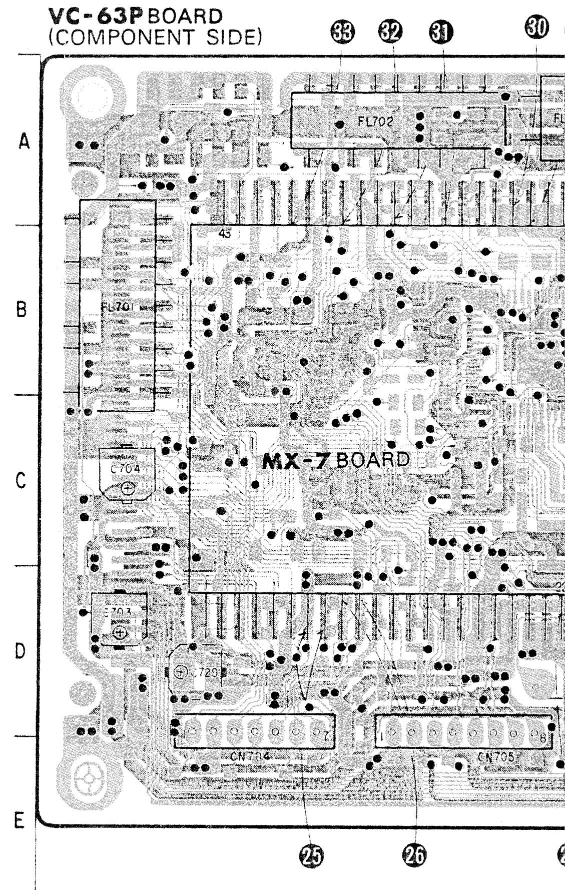

A
B
C
D
E
20
19
18
DT-73 BOARD
Q622
Q627
1-630-451-
TO VC-63P BOARD
17
9
12
11
10
15
13
14
16
21

D623	G-1
D624	G-2
D625	F-3
D626	I-3
IC620	I-2
IC621	H-3
Q620	J-4
Q621	J-4
Q622	A-3
Q623	A-3
Q624	H-4
Q625	I-4
Q626	I-4
Q627	C-5
Q628	I-4
Q629	G-1
Q630	G-2
Q631	H-2
Q632	H-2
Q633	G-2
Q634	F-4

VC-62P BOARD
(CONDUCTOR SIDE)

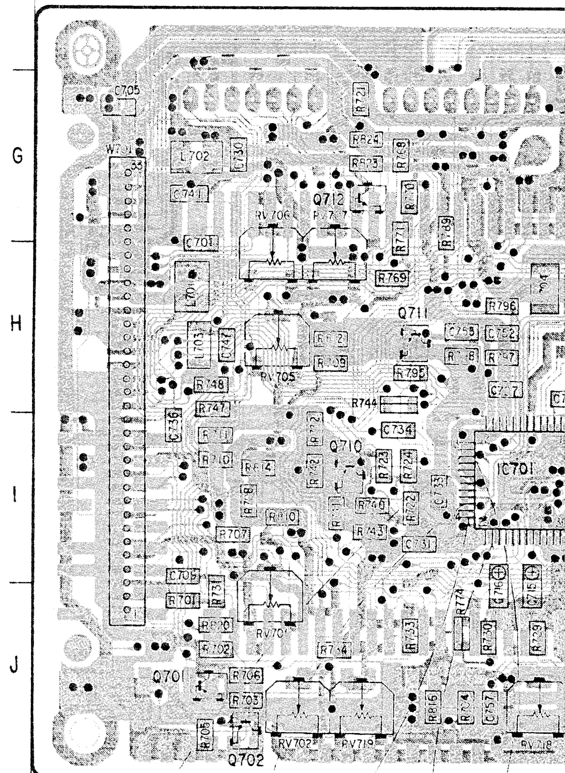

F
G
H
I
J
24
23
21
22
Q629
Q630
Q633
IC621
IC620
Q625
Q624
Q620
Q628
Q634
1-630-451-
21
1
2
3
4
5

VC-63P BOARD
(COMPONENT SIDE)


33
32
31
30
A
B
C
D
E
FL702
MX-7 BOARD
25
26

IC701	I-3
Q701	J-1
Q702	J-2
Q705	G-6
Q706	H-6
Q707	H-6
Q708	G-4
Q709	G-4
Q710	I-2
Q711	H-3
Q712	G-2

VC-63P BOARD
(CONDUCTOR SIDE)


F
G
H
I
J
Q712
Q711
Q710
IC701
Q701
Q702
1
2
3
36
38
39
40
37

2. **Adjust the zooming of camera and the tripod so that the output waveform of Fig. a and the picture of Fig. b can be obtain.**

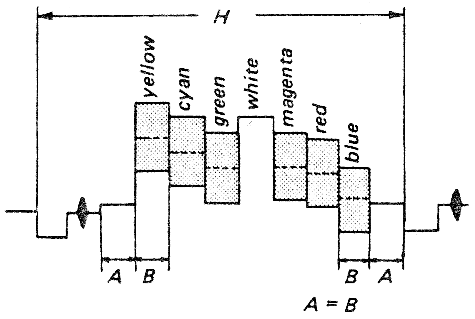

H
yellow
cyan
green
white
magenta
red
blue
A
B
B
A
A = B

Fig. a Camera output waveform of J361 on VA-43 board

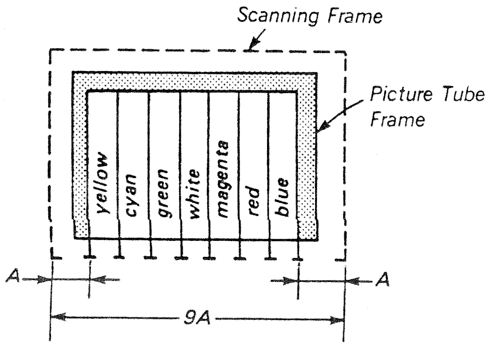

Scanning Frame
Picture Tube Frame
yellow
cyan
green
white
magenta
red
blue
A
A
9A

Fig. b Picture of TV monitor screen

(VIDEO/AUDIO, SERVO/SYSTEM CONTROL, MODE CONTROL, VIEWFINDER BLOCKS)

- Voltages are dc between ground and measurement points.
- Readings are taken with a color-bar signal input.
- Readings are taken with a digital multimeter (DC10MΩ).
- Voltage variations may be noted due to normal production tolerances.

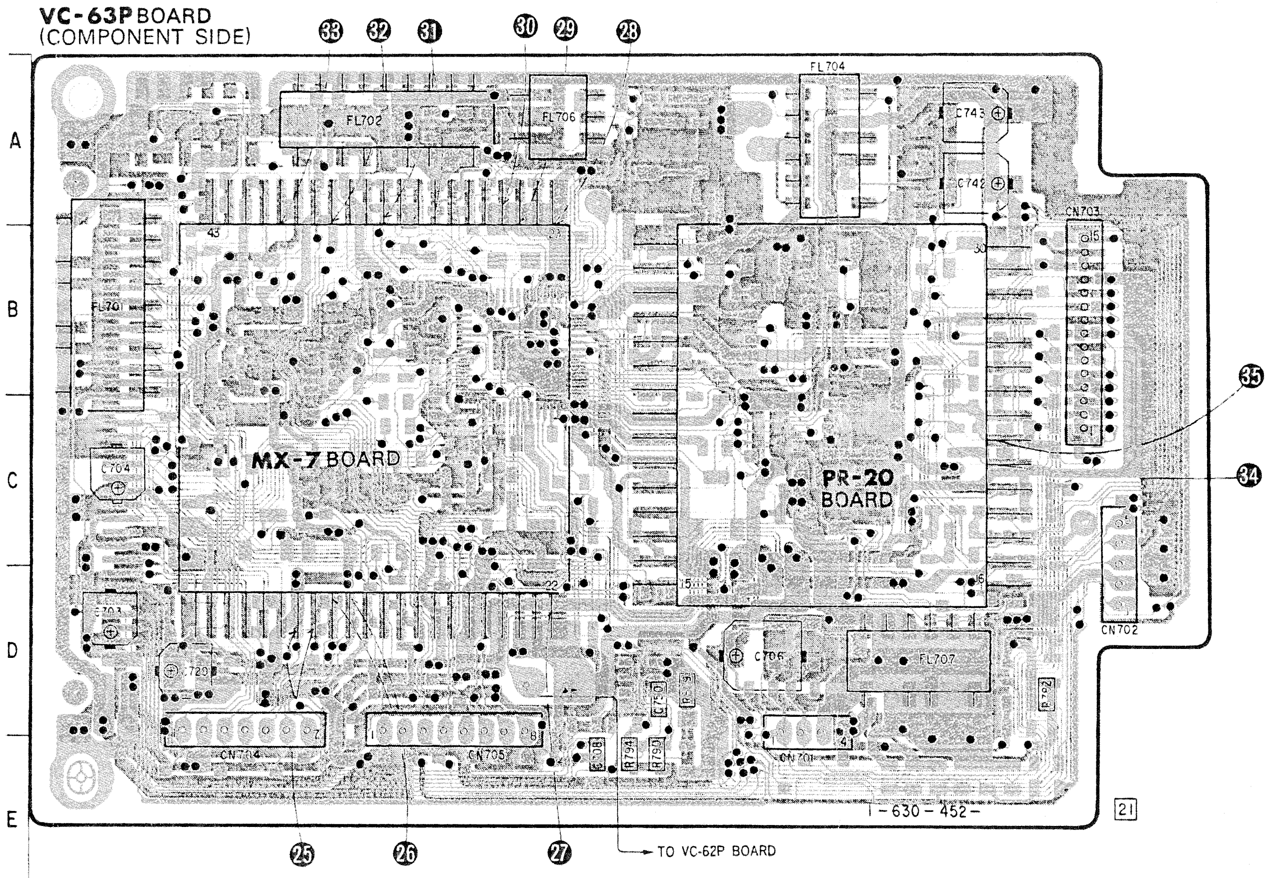
[REC Mode setting]

1) Input the video signal to TP362 on VA-43 board.
(Connect GND with TP361.)
2) Make soldering bridge for TPA land of VA-43 board.
3) Set to the camera mode.
4) Set to REC mode.
5) Make shorting 6 times for SVP (service point) of FV-4P board.
("6" is displayed on LCD.)
6) Input signal is monitored.

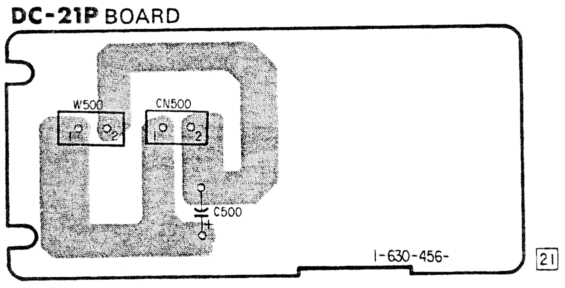
Note: When releasing, make shorting again for SVP of FV-4P board, or turn the power supply off.

701	I-3
01	J-1
02	J-2
05	G-6
06	H-6
07	H-6
08	G-4
09	G-4
10	I-2
11	H-3
12	G-2

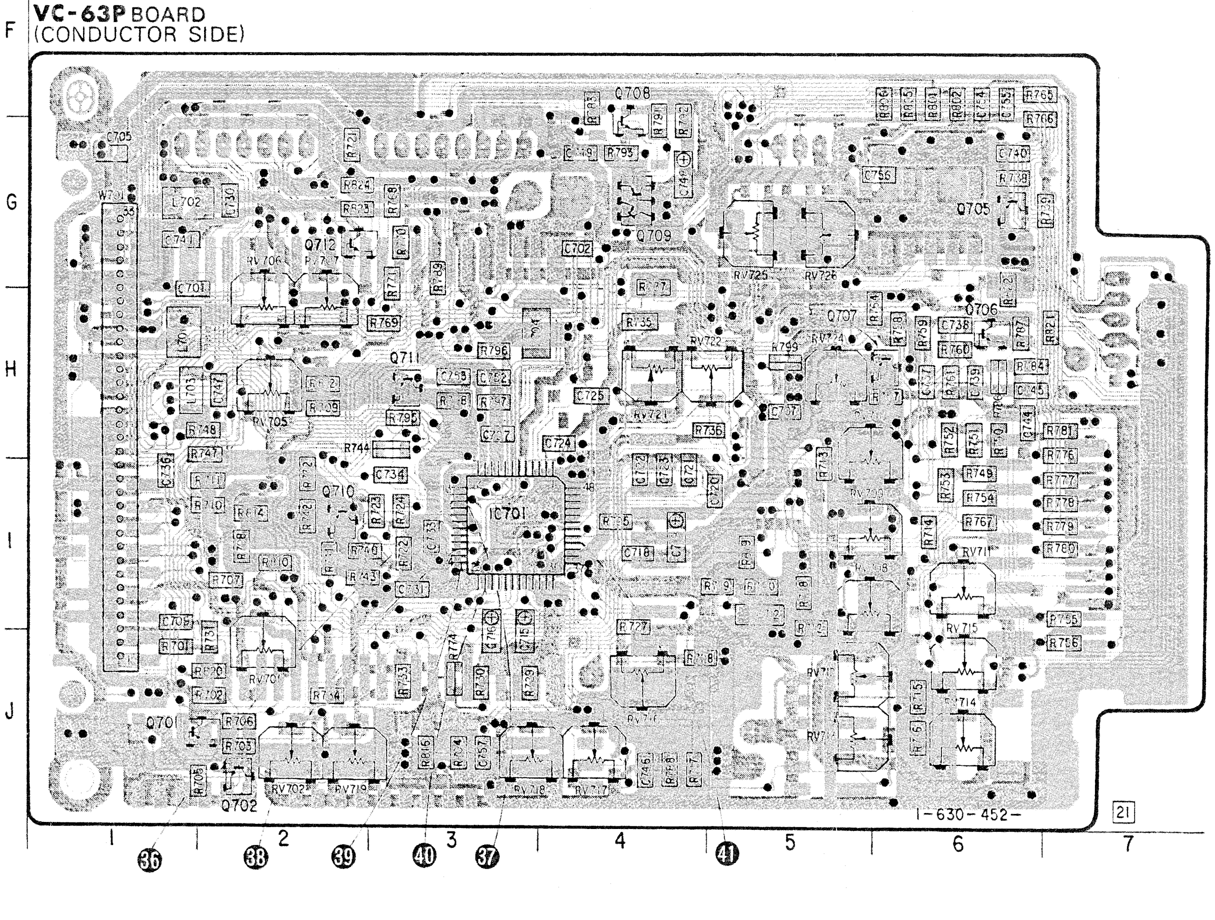
VC-63P BOARD
(COMPONENT SIDE)

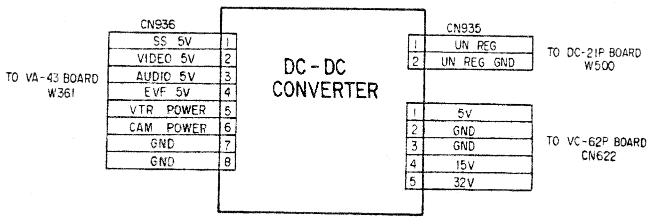

㉝
㉜
㉛
㉚
㉙
㉘
A
B
C
D
E
FL702
FL706
FL704
C743
C742
CN703
CN701
C704
MX-7 BOARD
PR-20 BOARD
㉟
㉞
CN702
C706
FL707
CN704
CN705
CN701
1-630-452-
21
㉕
㉖
㉗
TO VC-62P BOARD

DC-21P BOARD


W500
CN500
C500
1-630-456-
21

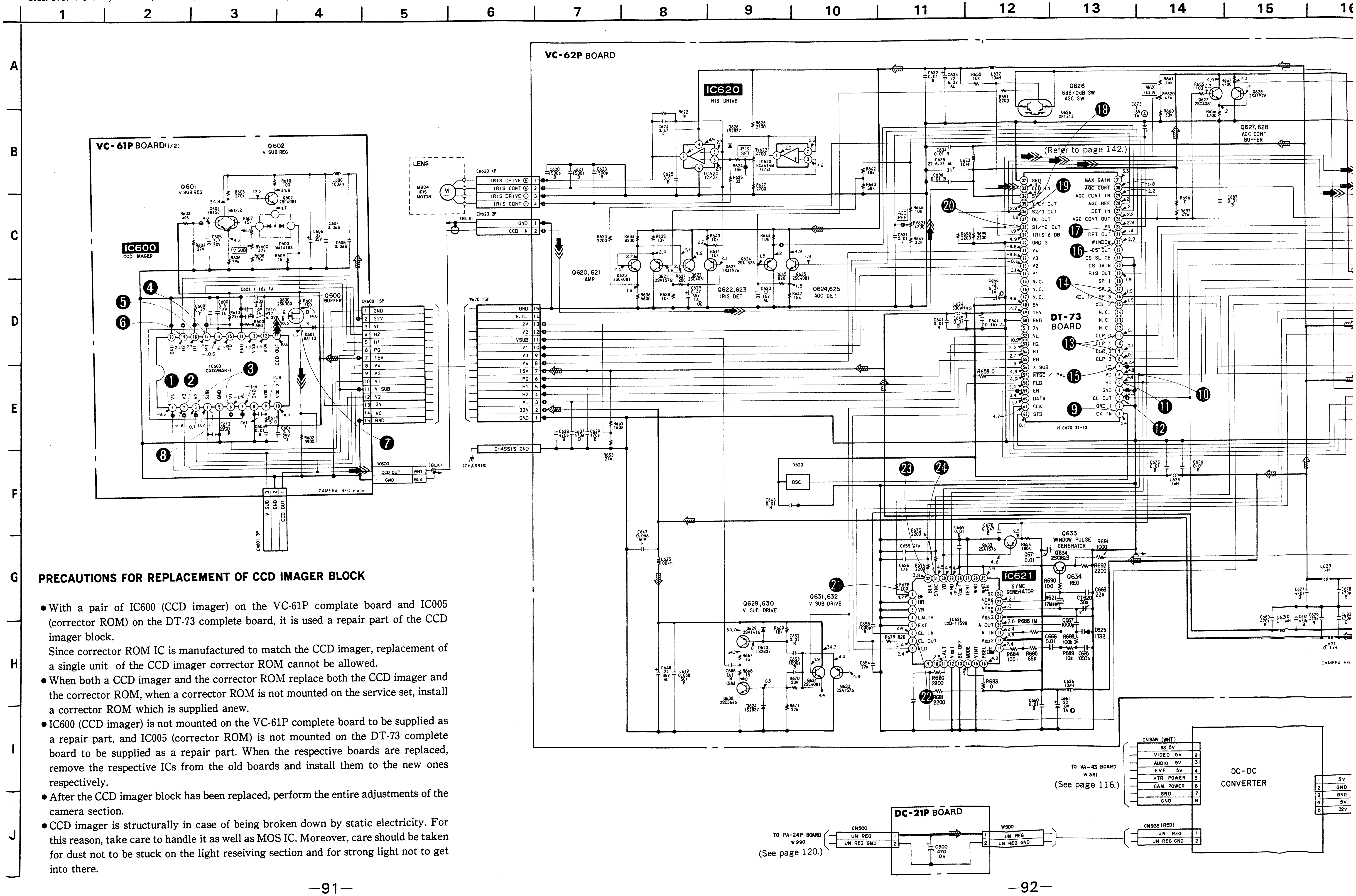
VC-63P BOARD
(CONDUCTOR SIDE)


F
G
H
I
J
Q708
Q705
Q712
Q709
Q707
Q706
Q711
Q710
IC701
Q701
Q702
RV725
RV726
RV702
RV719
RV715
RV714
1-630-452-
21
1
2
3
4
5
6
7
㊱
㊳
㊴
㊵
㊲
㊶


CN936
SS 5V
VIDEO 5V
AUDIO 5V
EVF 5V
VTR POWER
CAM POWER
GND
GND
1
2
3
4
5
6
7
8
TO VA-43 BOARD W361
DC-DC CONVERTER
CN935
UN REG
UN REG GND
TO DC-21P BOARD W500
5V
GND
GND
15V
32V
TO VC-62P BOARD CN622

VC-61P (CCD IMAGER), VC-62P (TIMING/SYNC GENERATOR), VC-63P (CAMERA MATRIX, CAMERA ENCORDER, TITLEMIX), DC-21P (RELAY) SCHEMATIC DIAGRAM

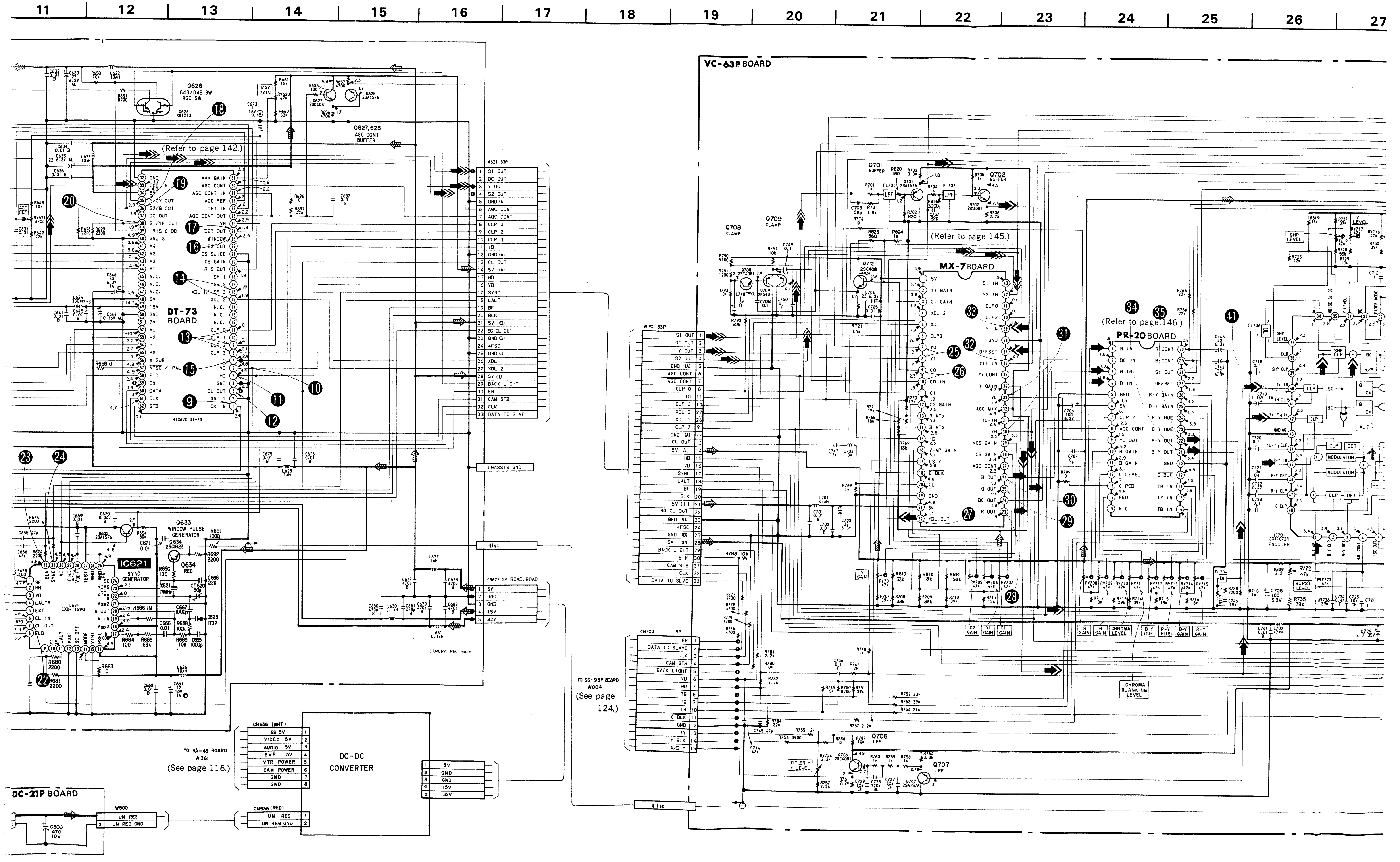
—Ref. No. VC-61P, VC-62P, VC-63P, DC-21P BOARDS; 1,000 series—



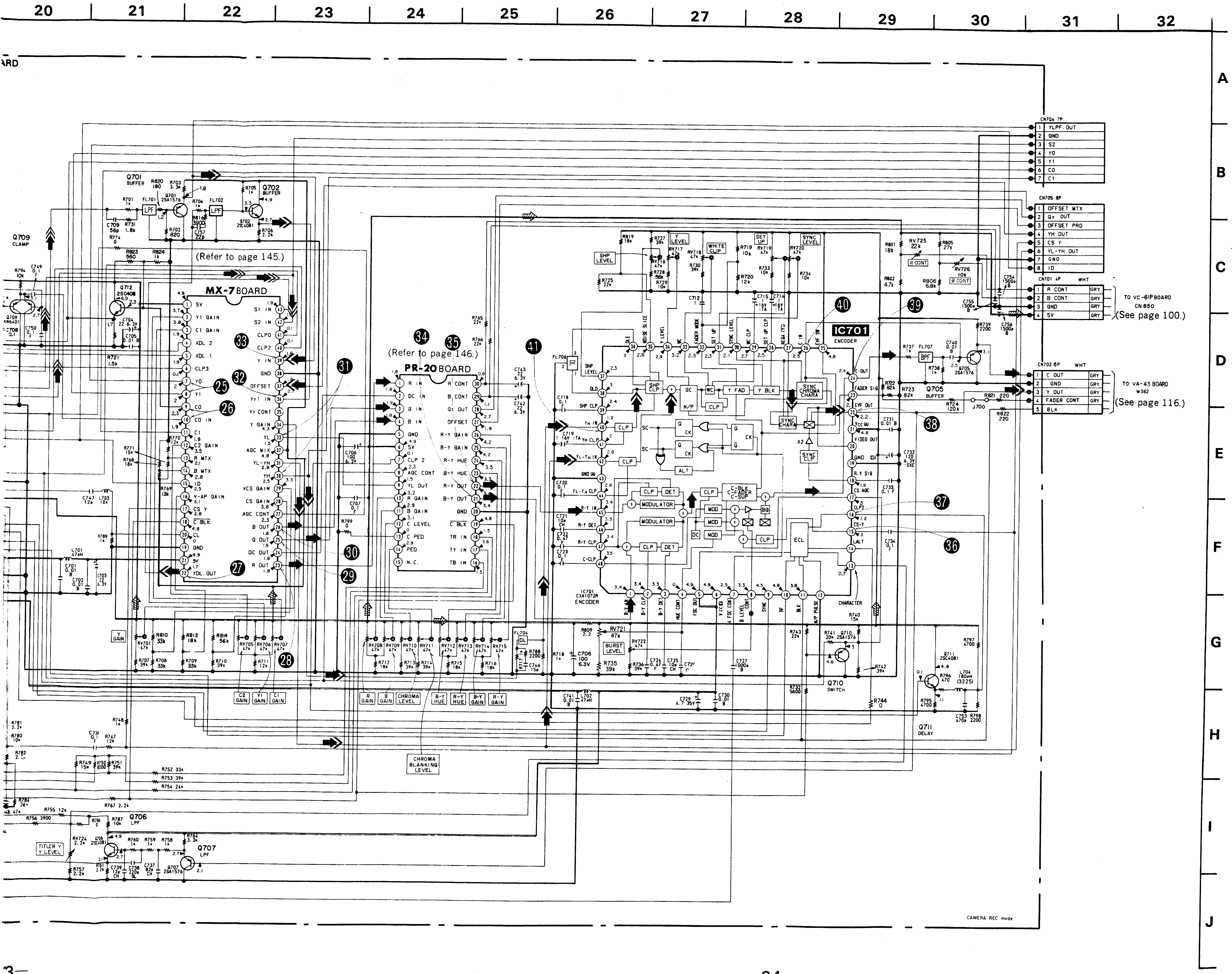
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
A
B
C
D
E
F
G
H
I
J
VC-61P BOARD(1/2)
IC600
CCD IMAGER
IC600 ICX026AK-1
Q600 BUFFER
Q601 V SUB REG
Q602 V SUB REG
CN600 15P
CN601 3P
V SUB
GND
CCD OUT
W600
CCD OUT
GND
WHT
BLK
CAMERA REC mode
LENS
M904 IRIS MOTOR
CN620 4P
IRIS DRIVE ⊕
IRIS CONT ⊕
IRIS DRIVE ⊖
IRIS CONT ⊖
CN623 2P
(BLK)
CCD IN
W620 15P
CHASSIS GND
(CHASSIS)
VC-62P BOARD
IC620
IRIS DRIVE
Q620,621 AMP
Q622,623 IRIS DET
Q624,625 AGC DET
Q626 6dB/0dB SW AGC SW
Q627,628 AGC CONT BUFFER
MAX GAIN
(Refer to page 142.)
DT-73 BOARD
HIC620 DT-73
X620
OSC.
IC621
SYNC GENERATOR
Q629,630 V SUB DRIVE
Q631,632 V SUB DRIVE
Q633 WINDOW PULSE GENERATOR
Q634 REG
CAMERA REC
CN936 (WHT)
SS 5V
VIDEO 5V
AUDIO 5V
EVF 5V
VTR POWER
CAM POWER
GND
GND
TO VA-43 BOARD W361
(See page 116.)
DC-DC CONVERTER
CN935 (RED)
UN REG
UN REG GND
DC-21P BOARD
CN500
UN REG
UN REG GND
C500 470 10V
W500
TO PA-24P BOARD W990
(See page 120.)

PRECAUTIONS FOR REPLACEMENT OF CCD IMAGER BLOCK

- With a pair of IC600 (CCD imager) on the VC-61P complate board and IC005 (corrector ROM) on the DT-73 complete board, it is used a repair part of the CCD imager block.
  Since corrector ROM IC is manufactured to match the CCD imager, replacement of a single unit of the CCD imager corrector ROM cannot be allowed.
- When both a CCD imager and the corrector ROM replace both the CCD imager and the corrector ROM, when a corrector ROM is not mounted on the service set, install a corrector ROM which is supplied anew.
- IC600 (CCD imager) is not mounted on the VC-61P complete board to be supplied as a repair part, and IC005 (corrector ROM) is not mounted on the DT-73 complete board to be supplied as a repair part. When the respective boards are replaced, remove the respective ICs from the old boards and install them to the new ones respectively.
- After the CCD imager block has been replaced, perform the entire adjustments of the camera section.
- CCD imager is structurally in case of being broken down by static electricity. For this reason, take care to handle it as well as MOS IC. Moreover, care should be taken for dust not to be stuck on the light reseiving section and for strong light not to get into there.



11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
VC-63P BOARD
DT-73 BOARD
(Refer to page 142.)
HIC620 DT-73
Q626 6dB/0dB SW AGC SW
Q627,628 AGC CONT BUFFER
MAX GAIN
W621 33P
S1 OUT
DC OUT
Y OUT
S2 OUT
GND (A)
AGC CONT
CLP 0
CLP 2
CLP 3
ID
CL OUT
5V (A)
HD
VD
SYNC
LALT
BF
BLK
SG CL OUT
4FSC
XDL 1
XDL 2
BACK LIGHT
EN
CAM STB
CLK
DATA TO SLVE
CHASSIS GND
4fsc
CN622 5P BOAD.BOAD
5V
GND
15V
32V
CAMERA REC mode
IC621 SYNC GENERATOR
IC621 CXD-1159Q
Q633 WINDOW PULSE GENERATOR
Q634 2SC1623
Q634 REG
DC-21P BOARD
W500
UN REG
UN REG GND
CN936 (WHT)
SS 5V
VIDEO 5V
AUDIO 5V
EVF 5V
VTR POWER
CAM POWER
GND
DC-DC CONVERTER
TO VA-43 BOARD W361 (See page 116.)
CN935 (RED)
W701 33P
CN703 15P
DATA TO SLAVE
CLK
CAM STB
BACK LIGHT
TB
TQ
TR
C BLK
TY
Y BLK
A/D Y
TO SS-93P BOARD W004 (See page 124.)
4 fsc
Q701 BUFFER
Q702 BUFFER
Q708 CLAMP
Q709 CLAMP
(Refer to page 145.)
MX-7 BOARD
PR-20 BOARD
(Refer to page 146.)
Q706 LPF
Q707 LPF
TITLER Y Y LEVEL
Y GAIN
C2 GAIN
Y1 GAIN
C1 GAIN
R GAIN
B GAIN
CHROMA LEVEL
B-Y HUE
R-Y HUE
B-Y GAIN
R-Y GAIN
CHROMA BLANKING LEVEL
BURST LEVEL
SHP LEVEL
Y LEVEL
IC701 CXA1072R ENCODER
MODULATOR
9
10
11
12
13
14
15
16
17
18
19
20
22
23
24
25
26
27
28
29
30
31
32
33
34
35
41


20
21
22
23
24
25
26
27
28
29
30
31
32
A
B
C
D
E
F
G
H
I
J
MX-7 BOARD
(Refer to page 145.)
PR-20 BOARD
(Refer to page 146.)
IC701
ENCODER
IC701 CXA1072R ENCODER
Q701 BUFFER
Q702 BUFFER
Q709 CLAMP
Q705 BUFFER
Q706 LPF
Q707 LPF
Q710 SWITCH
Q711 DELAY
CN704 7P
YLPF. OUT
GND
S2
Y0
Y1
C0
C1
CN705 8P
OFFSET MTX
Gr OUT
OFFSET PRO
YH OUT
CS Y
YL-YH OUT
GND
ID
CN701 4P WHT
R CONT
B CONT
GND
5V
TO VC-61P BOARD CN850
(See page 100.)
CN702 6P WHT
C OUT
GND
Y OUT
FADER CONT
BLK
TO VA-43 BOARD W362
(See page 116.)
SHP LEVEL
Y LEVEL
WHITE CLIP
SET UP
SYNC LEVEL
BURST LEVEL
Y GAIN
C2 GAIN
Y1 GAIN
C1 GAIN
R GAIN
B GAIN
CHROMA LEVEL
B-Y HUE
R-Y HUE
B-Y GAIN
R-Y GAIN
CHROMA BLANKING LEVEL
TITLER Y Y LEVEL
R CONT
B CONT
CAMERA REC mode

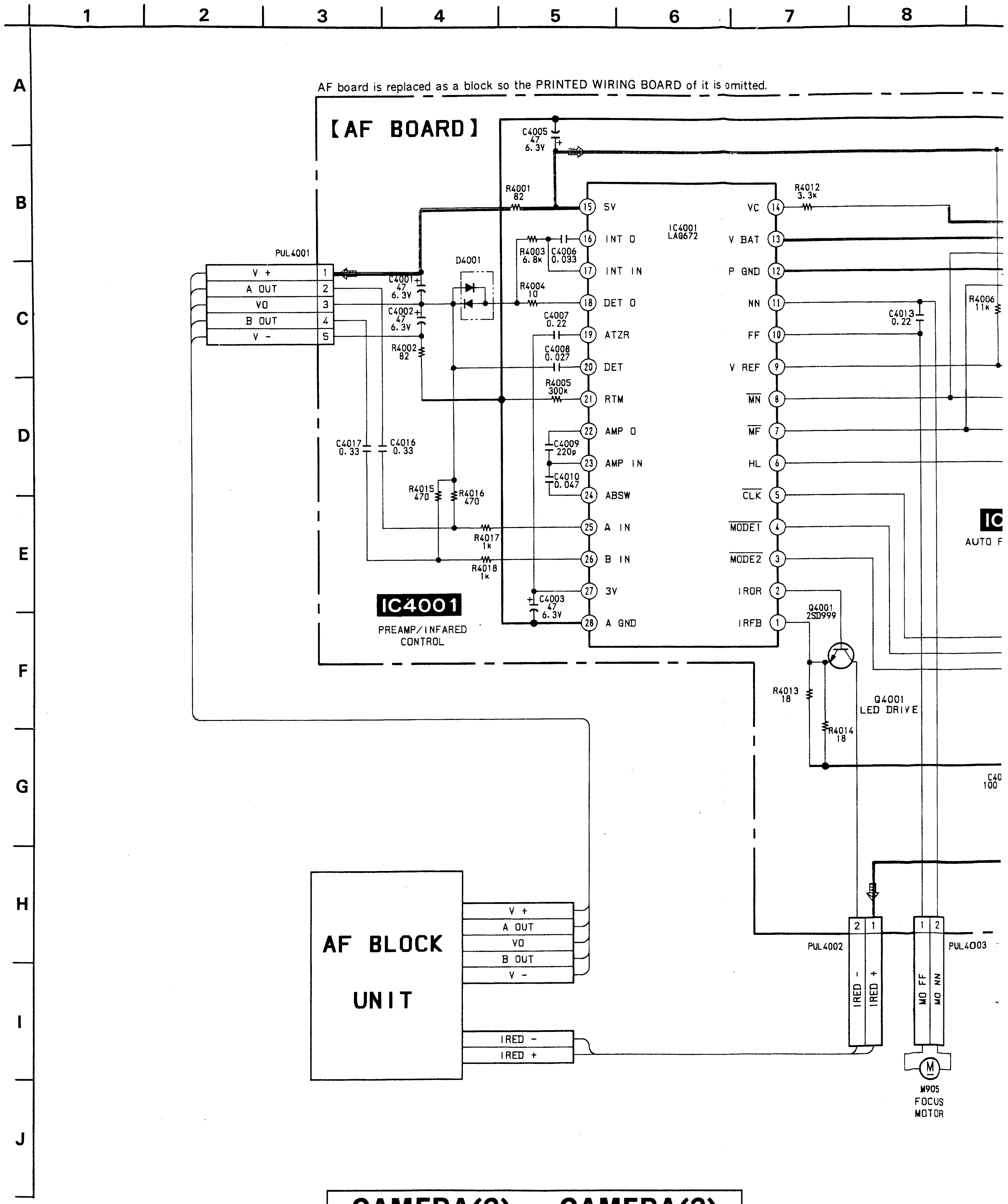
- **Signal path**

➡ : REC Y Signal
➡ : REC Y/CHROMA Signal
➡ : REC CHROMA Signal

CAMERA(1)

VC-61P (AUTO WHITE BALANCE), AF BOARD (AUTO FOCUS) PRINTED WIRING BOARDS

—Ref. No. VC-61P BOARD ; 1,000 series—

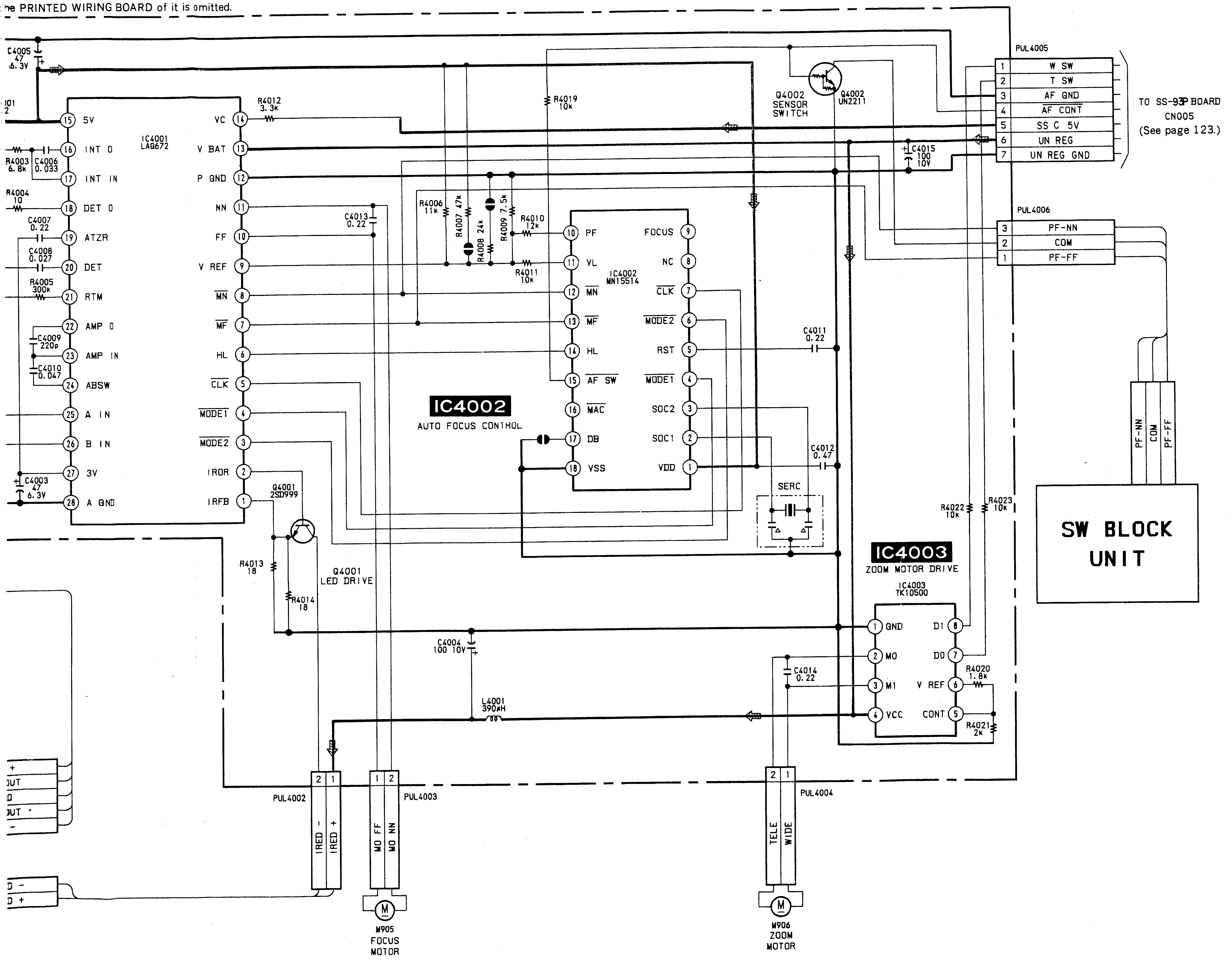


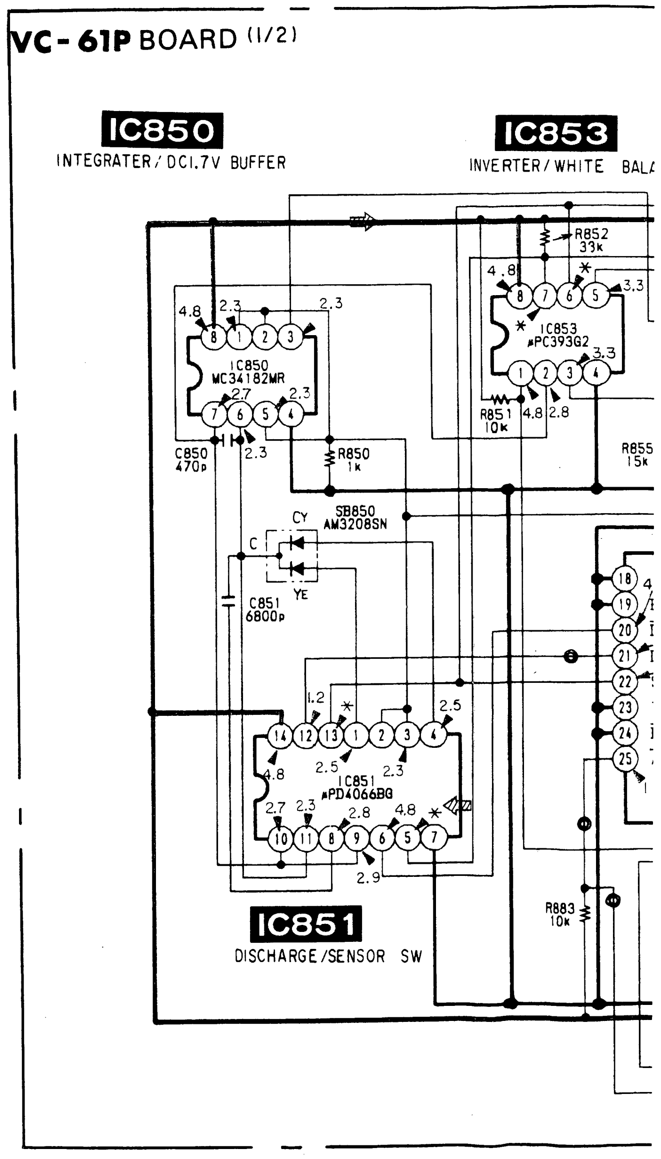
AF board is replaced as a block so the PRINTED WIRING BOARD of it is omitted.

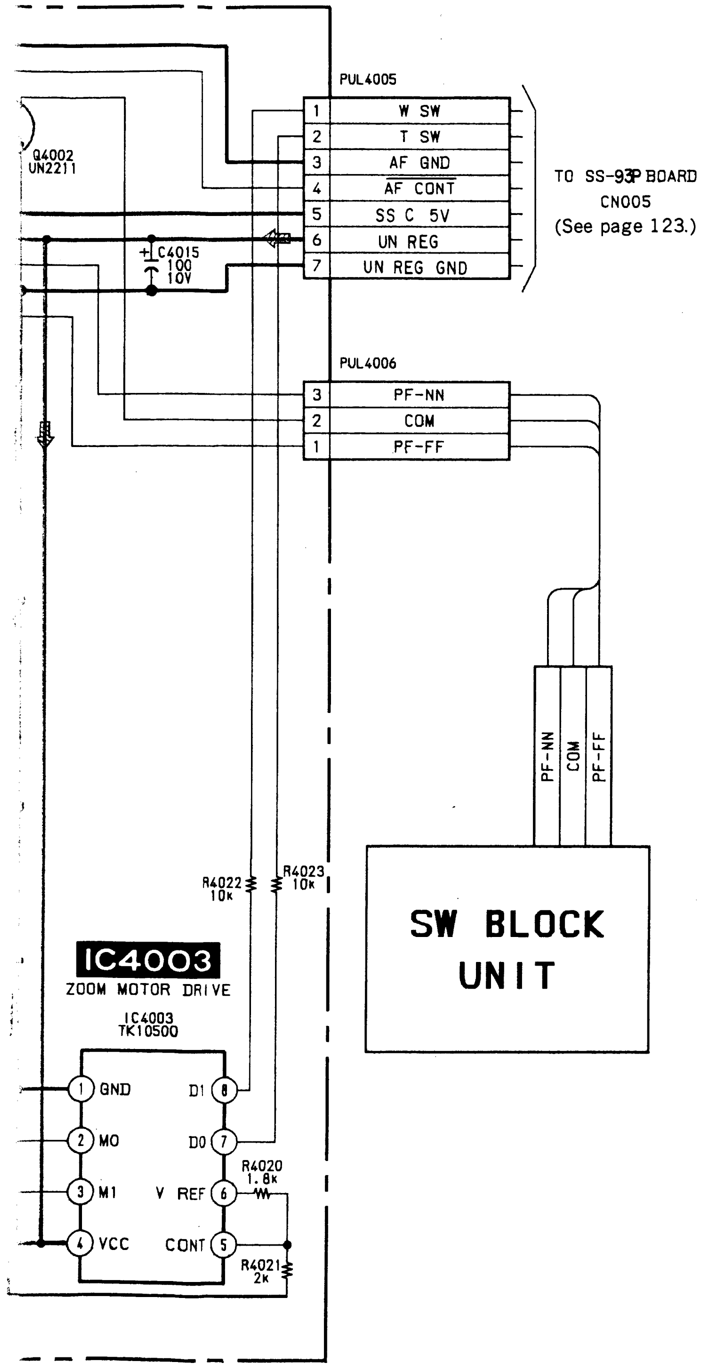
1
2
3
4
5
6
7
8
A
B
C
D
E
F
G
H
I
J
[AF BOARD]
C4005 47 6.3V
R4001 82
R4003 6.8k
C4006 0.033
R4004 10
C4007 0.22
C4008 0.027
R4005 300k
C4009 220p
C4010 0.047
C4003 47 6.3V
R4012 3.3k
IC4001 LA6672
15 5V
16 INT O
17 INT IN
18 DET O
19 ATZR
20 DET
21 RTM
22 AMP O
23 AMP IN
24 ABSW
25 A IN
26 B IN
27 3V
28 A GND
14 VC
13 V BAT
12 P GND
11 NN
10 FF
9 V REF
8 MN
7 MF
6 HL
5 CLK
4 MODE1
3 MODE2
2 IROR
1 IRFB
PUL4001
V +
A OUT
VO
B OUT
V -
C4001 47 6.3V
C4002 47 6.3V
R4002 82
D4001
C4017 0.33
C4016 0.33
R4015 470
R4016 470
R4017 1k
R4018 1k
IC4001
PREAMP/INFARED CONTROL
C4013 0.22
R4006 11k
IC
AUTO F
Q4001 2SD999
Q4001 LED DRIVE
R4013 18
R4014 18
C40 100
AF BLOCK UNIT
V +
A OUT
VO
B OUT
V -
IRED -
IRED +
PUL4002
2 1
IRED -
IRED +
1 2
MO FF
MO NN
PUL4003
M905 FOCUS MOTOR

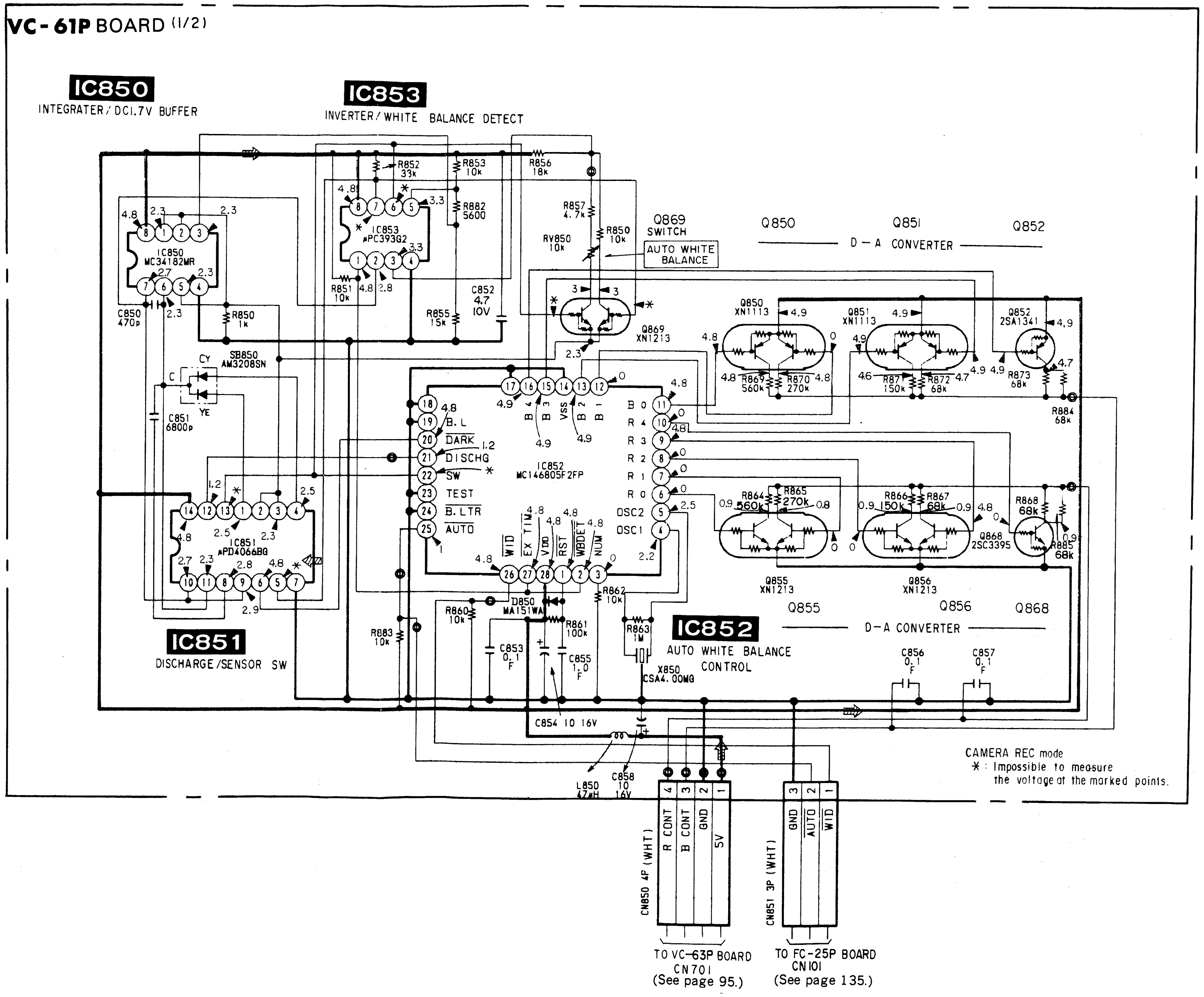
5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21

he PRINTED WIRING BOARD of it is omitted.


C4005 47 6.3V
IC4001 LA6672
5V
INT 0
INT IN
DET 0
ATZR
DET
RTM
AMP 0
AMP IN
ABSW
A IN
B IN
3V
A GND
VC
V BAT
P GND
NN
FF
V REF
MN
MF
HL
CLK
MODE1
MODE2
IROR
IRFB
R4003 6.8k
C4006 0.033
R4004 10
C4007 0.22
C4008 0.027
R4005 300k
C4009 220p
C4010 0.047
C4003 47 6.3V
R4012 3.3k
C4013 0.22
R4006 11k
R4007 47k
R4008 24k
R4009 7.5k
R4010 12k
R4011 10k
R4019 10k
IC4002 MN15514
PF
VL
MN
MF
HL
AF SW
MAC
DB
VSS
FOCUS
NC
CLK
MODE2
RST
MODE1
SOC2
SOC1
VDD
IC4002
AUTO FOCUS CONTROL
Q4002 SENSOR SWITCH
Q4002 UN2211
C4011 0.22
C4012 0.47
SERC
Q4001 2SD999
Q4001 LED DRIVE
R4013 18
R4014 18
C4004 100 10V
L4001 390μH
C4014 0.22
C4015 100 10V
IC4003
ZOOM MOTOR DRIVE
IC4003 TK10500
GND
MO
M1
VCC
D1
DO
V REF
CONT
R4020 1.8k
R4021 2k
R4022 10k
R4023 10k
PUL4005
W SW
T SW
AF GND
AF CONT
SS C 5V
UN REG
UN REG GND
TO SS-93P BOARD CN005 (See page 123.)
PUL4006
PF-NN
COM
PF-FF
SW BLOCK UNIT
PUL4002
IRED -
IRED +
PUL4003
MO FF
MO NN
M905 FOCUS MOTOR
PUL4004
TELE
WIDE
M906 ZOOM MOTOR
OUT
OUT


VC-61P BOARD (1/2)
IC850
INTEGRATER/DC1.7V BUFFER
IC853
INVERTER/WHITE BAL
IC850 MC34182MR
IC853 μPC393G2
R852 33k
R851 10k
R850 1k
R855 15k
C850 470p
SB850 AM3208SN
CY
YE
C851 6800p
IC851 μPD4066BG
R883 10k
IC851
DISCHARGE/SENSOR SW


PUL4005
1 W SW
2 T SW
3 AF GND
4 AF CONT
5 SS C 5V
6 UN REG
7 UN REG GND
TO SS-93P BOARD
CN005
(See page 123.)
Q4002
UN2211
C4015
100
10V
PUL4006
3 PF-NN
2 COM
1 PF-FF
PF-NN
COM
PF-FF
SW BLOCK UNIT
R4022 10k
R4023 10k
IC4003
ZOOM MOTOR DRIVE
IC4003
TK10500
1 GND
2 MO
3 M1
4 VCC
D1 8
DO 7
V REF 6
CONT 5
R4020 1.8k
R4021 2k

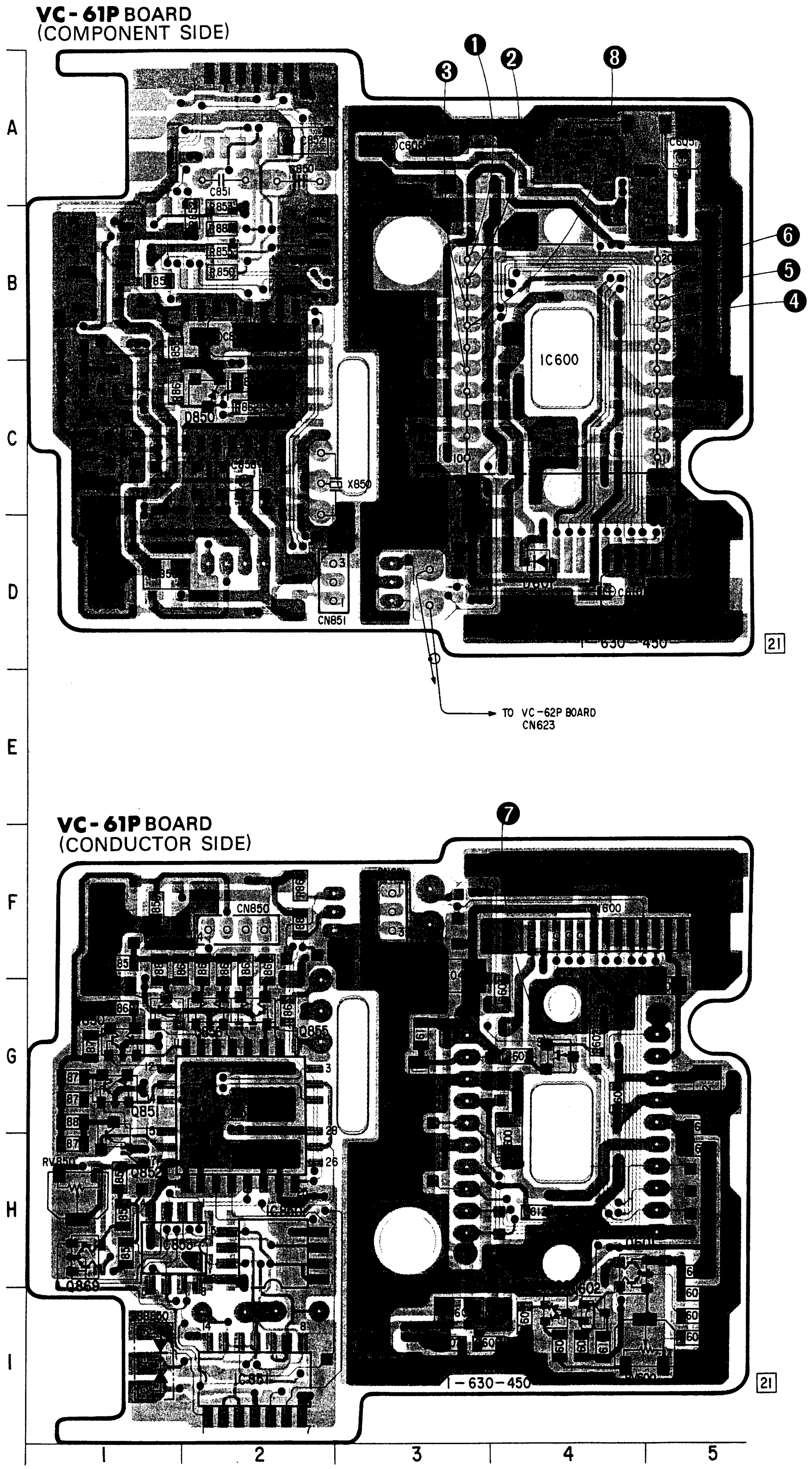

VC-61P BOARD (1/2)
IC850
INTEGRATER/DC1.7V BUFFER
IC850
MC34182MR
IC853
INVERTER/WHITE BALANCE DETECT
IC853
μPC393G2
R852 33k
R853 10k
R856 18k
R857 4.7k
R882 5600
RV850 10k
R850 10k
R851 10k
R855 15k
C852 4.7 10V
C850 470p
R850 1k
Q869
SWITCH
AUTO WHITE BALANCE
Q869
XN1213
Q850
Q851
Q852
D-A CONVERTER
Q850 XN1113
Q851 XN1113
Q852 2SA1341
R869 560k
R870 270k
R871 150k
R872 68k
R873 68k
R884 68k
SB850
AM3208SN
CY
C
YE
C851 6800p
IC852
MC146805F2FP
18 4.8
19 B.L
20 DARK
21 DISCHG
22 SW
23 TEST
24 B.LTR
25 AUTO
17 B4
16 B3
15 VSS
14 B2
13 B1
B0 11
R4 10
R3 9
R2 8
R1 7
R0 6
OSC2 5
OSC1 4
26 WID
27 EX TIM
28 VDD
1 RST
2 WBDET
3 NUM
IC851
DISCHARGE/SENSOR SW
IC851
μPD4066BG
D850 MA151WA
R860 10k
R861 100k
R862 10k
R863 1M
R883 10k
C853 0.1 F
C855 1.0 F
C854 10 16V
X850 CSA4.00MG
IC852
AUTO WHITE BALANCE CONTROL
R864 560k
R865 270k
R866 150k
R867 68k
R868 68k
R885 68k
Q855 XN1213
Q856 XN1213
Q868 2SC3395
Q855
Q856
Q868
D-A CONVERTER
C856 0.1 F
C857 0.1 F
L850 47μH
C858 10 16V
CN850 4P (WHT)
4 R CONT
3 B CONT
2 GND
1 5V
CN851 3P (WHT)
3 GND
2 AUTO
1 WID
TO VC-63P BOARD
CN701
(See page 95.)
TO FC-25P BOARD
CN101
(See page 135.)

CAMERA REC mode
＊: Impossible to measure the voltage at the marked points.

VC-61P (AUTO WHITE BALANCE) PRINTED WIRING BOARD

—Ref. No. VC-61P BOARD ; 1,000 series—

D600	I-4
D601	D-4
D850	C-2
IC600	B-4
IC850	H-2
IC851	I-2
IC852	G-2
IC853	H-1
Q600	G-4
Q601	I-1
Q602	I-4
Q850	G-1
Q851	G-1
Q852	H-1
Q855	G-2
Q856	G-2
Q868	G-1
Q869	H-1



VC-61P BOARD
(COMPONENT SIDE)

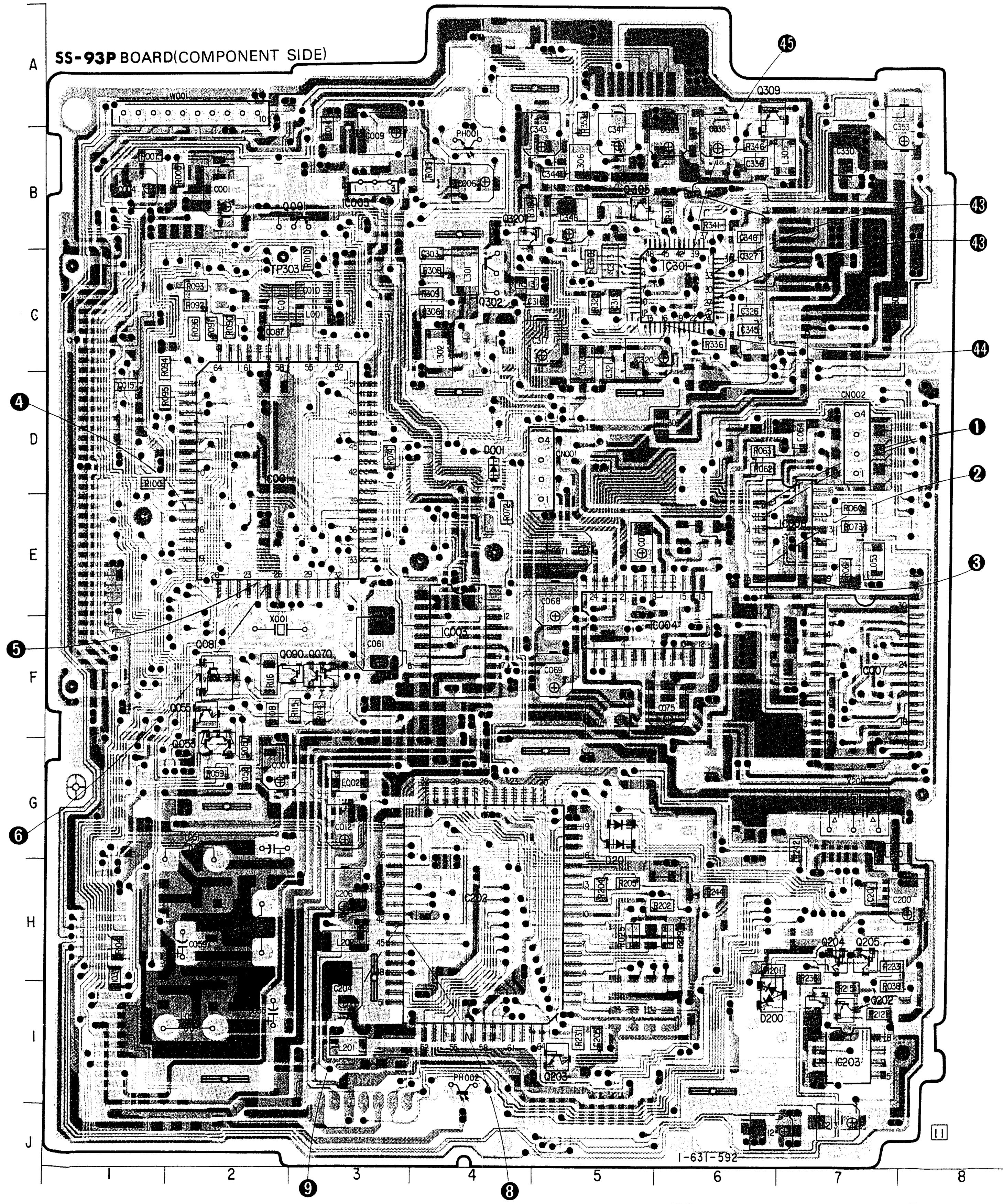
VC-61P BOARD
(CONDUCTOR SIDE)

A
B
C
D
E
F
G
H
I
1
2
3
4
5
❶
❷
❸
❹
❺
❻
❼
❽
IC600
C851
X850
D850
CN851
1-630-450
21
TO VC-62P BOARD
CN623
CN850
RV850
Q868
Q855
1-630-450
21

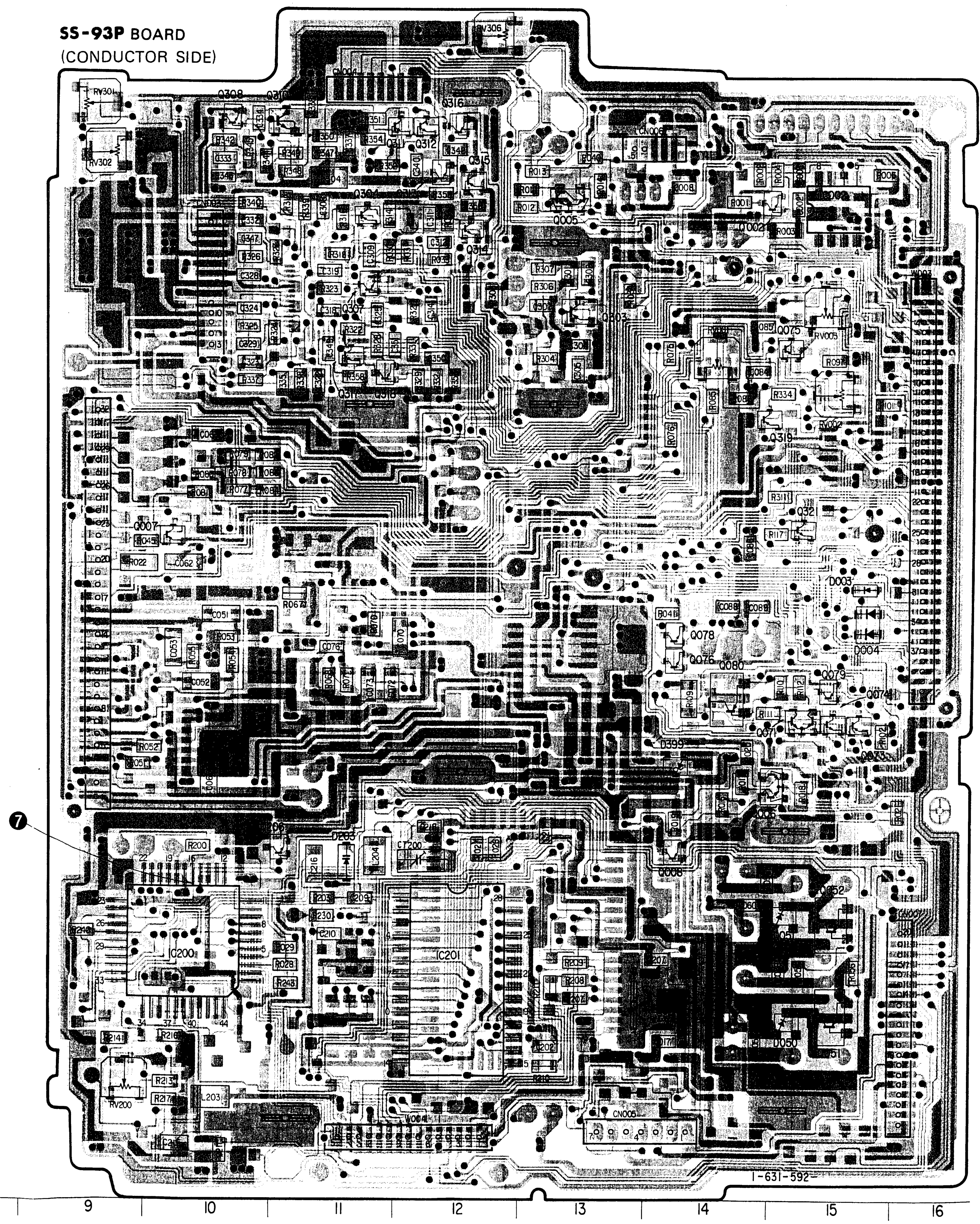
SS-93P (DIGITAL TITLER) PRINTED WIRING BOARD

—Ref. No. SS-93P BOARD ; 2,000 series—

D001	D-4	IC003	F-4	Q001	B-3	Q070	F-3	Q201	I-7	Q308	A-10	Q319	D-14
D003	E-15	IC004	F-5	Q002	B-14	Q071	F-15	Q202	I-7	Q309	A-6	Q320	B-4
D004	E-15	IC005	B-3	Q005	B-13	Q073	F-15	Q203	I-5	Q310	A-11	Q321	F-15
D050	I-15	IC006	E-7	Q006	G-14	Q074	F-15	Q204	H-7	Q311	A-12		
D051	H-15	IC007	F-7	Q007	E-10	Q075	C-15	Q205	H-7	Q312	A-12		
D200	I-6	IC200	H-10	Q008	G-14	Q076	F-14	Q206	G-11	Q313	B-12		
D201	G-5	IC201	H-12	Q051	I-15	Q078	F-14	Q302	C-4	Q314	B-12		
D203	G-11	IC202	H-4	Q052	H-15	Q079	F-15	Q303	C-13	Q315	B-12		
D399	F-14	IC203	I-7	Q053	G-2	Q080	F-14	Q304	B-11	Q316	A-12		
		IC301	C-6	Q054	E-6	Q081	F-2	Q305	B-5	Q317	C-11		
IC001	D-2			Q055	F-2	Q090	F-2	Q307	C-11	Q318	C-11		
IC002	B-15												


SS-93P BOARD(COMPONENT SIDE)

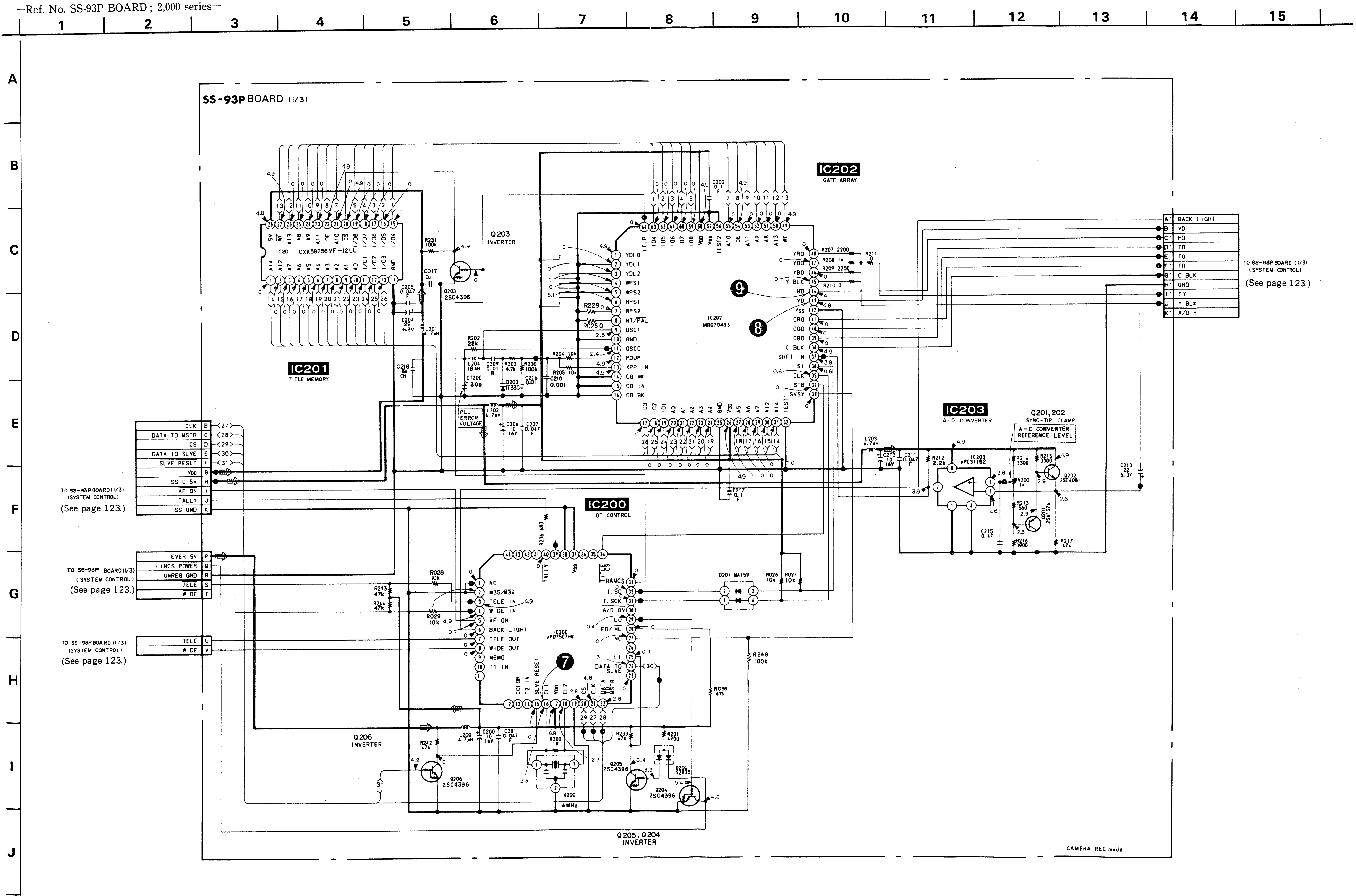
A
B
C
D
E
F
G
H
I
J
1
2
3
4
5
6
7
8
1-631-592
IC301
IC003
IC004
IC007
IC202
IC203
CN001
CN002
X001
PH001
PH002
D200
❶
❷
❸
❹
❺
❻
❽
❾
㊸
㊸
㊹
㊺

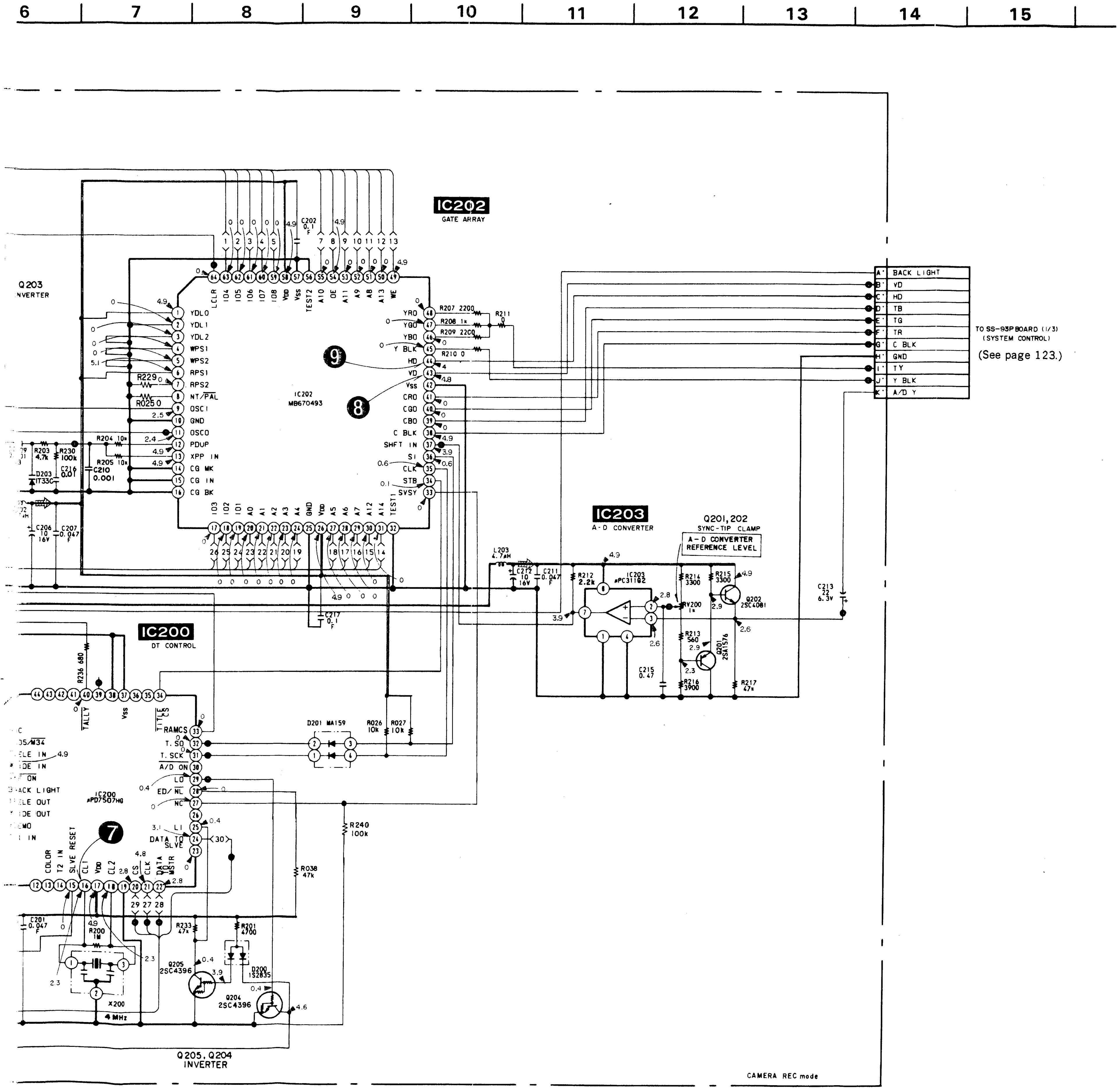

SS-93P BOARD
(CONDUCTOR SIDE)

9
10
11
12
13
14
15
16
1-631-592
IC200
IC201
RV306
RV301
RV302
RV200
CN004
CN005
CN006
❼

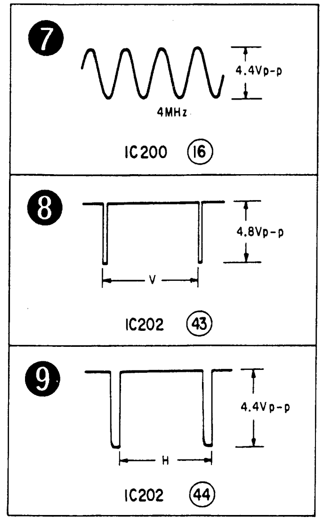
SS-93P (DIGITAL TITLER) SCHEMATIC DIAGRAM

—Ref. No. SS-93P BOARD ; 2,000 series—

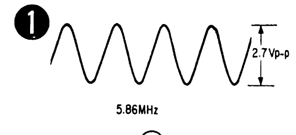

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
A
B
C
D
E
F
G
H
I
J
SS-93P BOARD (1/3)
IC201
TITLE MEMORY
IC201 CXK58256MF-12LL
Q203
INVERTER
Q203 2SC4396
IC202
GATE ARRAY
IC202 MB670493
IC203
A-D CONVERTER
IC203 μPC311G2
Q201,202
SYNC-TIP CLAMP
A-D CONVERTER REFERENCE LEVEL
Q201 2SA1576
Q202 2SC4081
IC200
DT CONTROL
IC200 μPD7507HG
PLL ERROR VOLTAGE
D201 MA159
D202 1S2835
D203 1T33C
X200 4MHz
Q206
INVERTER
Q206 2SC4396
Q205 2SC4396
Q204 2SC4396
Q205, Q204
INVERTER
CLK
DATA TO MSTR
CS
DATA TO SLVE
SLVE RESET
VDD
SS C 5V
AF ON
TALLY
SS GND
TO SS-93P BOARD (1/3) (SYSTEM CONTROL)
(See page 123.)
EVER 5V
LINCS POWER
UNREG GND
TELE
WIDE
TO SS-93P BOARD (1/3) (SYSTEM CONTROL)
(See page 123.)
TELE
WIDE
TO SS-93P BOARD (1/3) (SYSTEM CONTROL)
(See page 123.)
BACK LIGHT
VD
HD
TB
TG
TR
C BLK
GND
TY
Y BLK
A/D Y
TO SS-93P BOARD (1/3) (SYSTEM CONTROL)
(See page 123.)
YDL0
YDL1
YDL2
WPS1
WPS2
RPS1
RPS2
NT/PAL
OSC1
GND
OSCO
PDUP
XPP IN
CG MK
CG IN
CG BK
YRO
YGO
YBO
Y BLK
HD
VD
Vss
CRO
CGO
CBO
C BLK
SHFT IN
SI
CLK
STB
SVSY
NC
M35/M34
TELE IN
WIDE IN
AF ON
BACK LIGHT
TELE OUT
WIDE OUT
MEMO
T1 IN
RAMCS
T. SO
T. SCK
A/D ON
LD
ED/NL
NC
LI
DATA TO SLVE
COLOR
T2 IN
SLVE RESET
CL1
CL2
CS
CLK
DATA TO MSTR
TALLY
Vss
TITLE CS
R231 100k
C017 0.1
C205 0.047
C204 22 6.3V
L201 4.7μH
R202 22k
L204 18μH
C209 0.01
R203 4.7k
R230 100k
C216 0.01
CT200 30p
C218 8p CH
R204 10k
R205 10k
C210 0.001
R229
R025 0
L202 4.7μH
C206 10 16V
C207 0.047
C202 0.1
R207 2200
R208 1k
R209 2200
R210 0
R211 0
L203 4.7μH
C212 10 16V
C211 0.047
R212 2.2k
R214 3300
R215 3300
R200 1k
R213 560
R216 3900
R217 47k
C215 0.47
C213 22 6.3V
C217 0.1
R236 680
R028 10k
R029 10k
R243 47k
R244 47k
R026 10k
R027 10k
R240 100k
R038 47k
R242 47k
L200 4.7μH
C200 10 16V
C201 0.047
R200 1M
R233 47k
R201 4700
⑦
⑧
⑨
CAMERA REC mode


6
7
8
9
10
11
12
13
14
15
IC202
GATE ARRAY
IC202
MB670493
YDL0
YDL1
YDL2
WPS1
WPS2
RPS1
RPS2
NT/PAL
OSCI
GND
OSCO
PDUP
XPP IN
CG MK
CG IN
CG BK
LCLR
IO4
IO5
IO6
IO7
IO8
VDD
Vss
TEST2
A10
OE
A11
A9
A8
A13
WE
YRO
YGO
YBO
Y BLK
HD
VD
Vss
CRO
CGO
CBO
C BLK
SHFT IN
SI
CLK
STB
SVSY
IO3
IO2
IO1
A0
A1
A2
A3
A4
GND
VDD
A5
A6
A7
A12
A14
TEST1
R207 2200
R208 1k
R209 2200
R210 0
R211 0
R229
R025 0
R204 10k
R205 10k
R203 4.7k
R230 100k
C216 0.01
C210 0.001
D203 1T33C
C206 10 16V
C207 0.047
C202 0.1
C217 0.1
Q203 INVERTER
A' BACK LIGHT
B' VD
C' HD
D' TB
E' TG
F' TR
G' C BLK
H' GND
I' TY
J' Y BLK
K' A/D Y
TO SS-93P BOARD (1/3) (SYSTEM CONTROL)
(See page 123.)
IC203
A-D CONVERTER
IC203 μPC3116Z
Q201,202
SYNC-TIP CLAMP
A-D CONVERTER REFERENCE LEVEL
L203 4.7μH
C212 10 16V
C211 0.047
R212 2.2k
R214 3300
R215 3300
RV200 1k
R213 560
R216 3900
R217 47k
C215 0.47
C213 22 6.3V
Q201 2SA1576
Q202 2SC4081
IC200
DT CONTROL
IC200 μPD7507HG
R236 680
TALLY
Vss
TTLCS
RAMCS
T.SO
T.SCK
A/D ON
LD
ED/NL
NC
LI
DATA TO SLVE
COLOR
T2 IN
SLVE RESET
CL1
VDD
CL2
CS
CLK
DATA MSTR
D201 MA159
R026 10k
R027 10k
R240 100k
R038 47k
C201 0.047
R200 1M
X200
4MHz
R233 47k
R201 4700
D200 1S2835
Q205 2SC4396
Q204 2SC4396
Q205,Q204
INVERTER
CAMERA REC mode

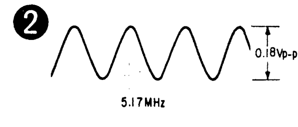
SS-93P BOARD


7
4.4Vp-p
4MHz
IC200 (16)
8
4.8Vp-p
V
IC202 (43)
9
4.4Vp-p
H
IC202 (44)

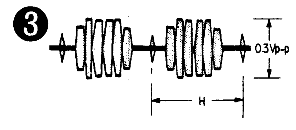
VA-43 BOARD

❶


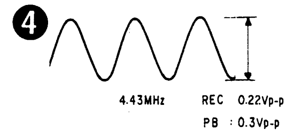
IC250 ⑭ REC/PB

❷


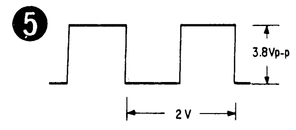
IC360 ① REC/PB

❸


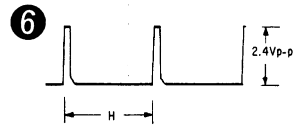
IC360 ④ PB

❹


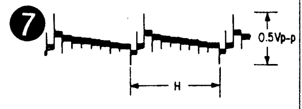
IC360 ⑬ REC/PB

❺


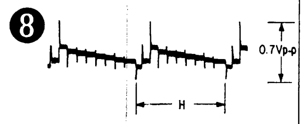
IC360 ⑭ REC/PB

❻


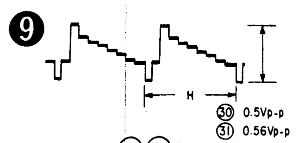
IC360 ⑳ REC/PB

❼


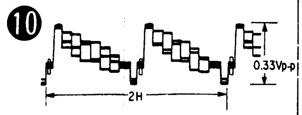
IC360 ㉒ ㉓ PB

❽


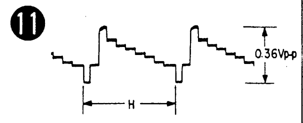
IC360 ㉕ REC

❾


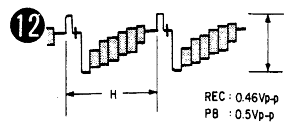
IC360 ㉚ ㉛ PB

❿


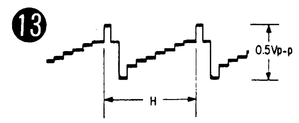
IC360 ㉟ REC

⓫


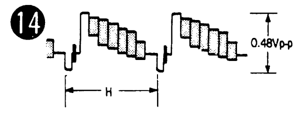
IC360 ㉟ PB

⓬


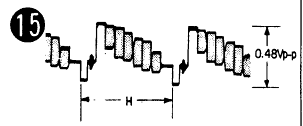
IC360 ㊺ REC/PB ㊼ REC

⓭


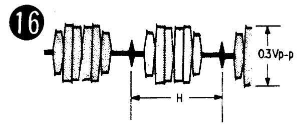
IC360 ㊼ PB

⓮


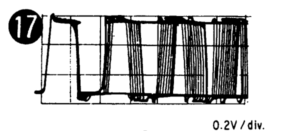
IC360 ㊾ REC

⓯


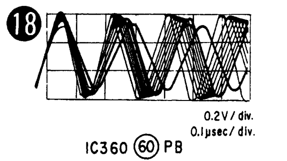
IC360 (56) PB

⓰


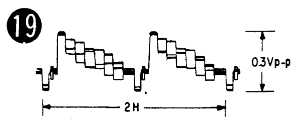
IC360 (57) PB

⓱


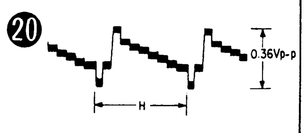
IC360 (59) REC

⓲


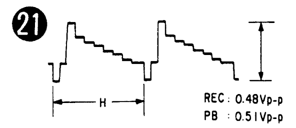
IC360 (60) PB

⓳


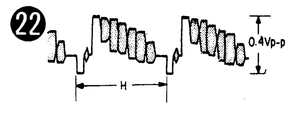
IC361 ⑪ REC

⓴


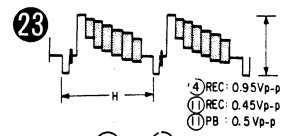
IC361 ⑪ PB

㉑


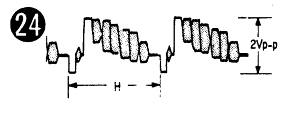
IC365 ⑦ REC/PB

㉒


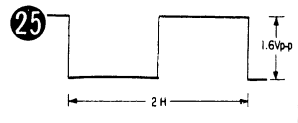
IC362 ② PB

㉓


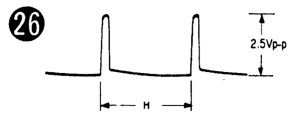
IC362 ④ REC ⑪ REC, PB

㉔


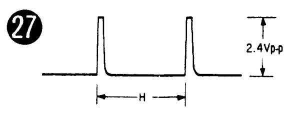
IC362 ⑧ PB

㉕


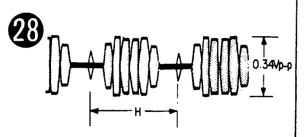
IC363 ④ PB

㉖


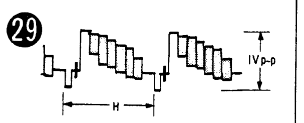
IC363 ⑩ PB

㉗


IC363 ⑪ PB

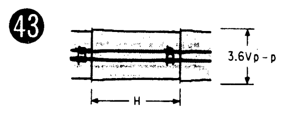
㉘


IC363 ⑮ PB

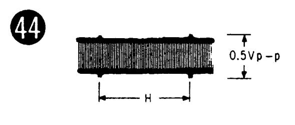
㉙


(COLOR BAR INPUT SIGNAL)
TP362 REC

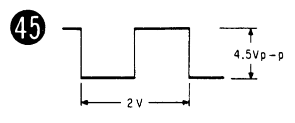
SS-93P BOARD

㊸


IC301 ㉘ , ㉝ REC

㊹


IC301 ⑯ PB

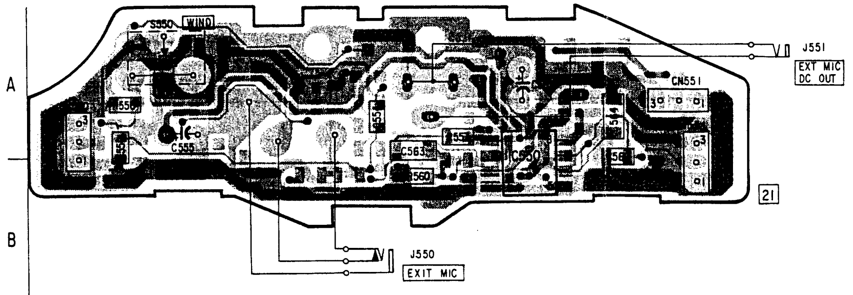
㊺


IC301 ㊴ REC/PB

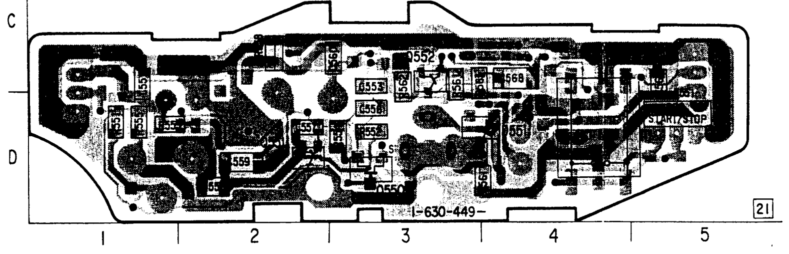
SS-93P (REC/PB AMP), VA-43 (VIDEO/AUDIO SIGNAL PROESS), MC-36P (MIC AMP, START/STOP SWITCH) PRINTED WIRING BOARDS

—Ref. No. SS-93P, VA-43, MC-36P BOARDS ; 2,000 series—

MC-36P BOARD (COMPONENT SIDE)

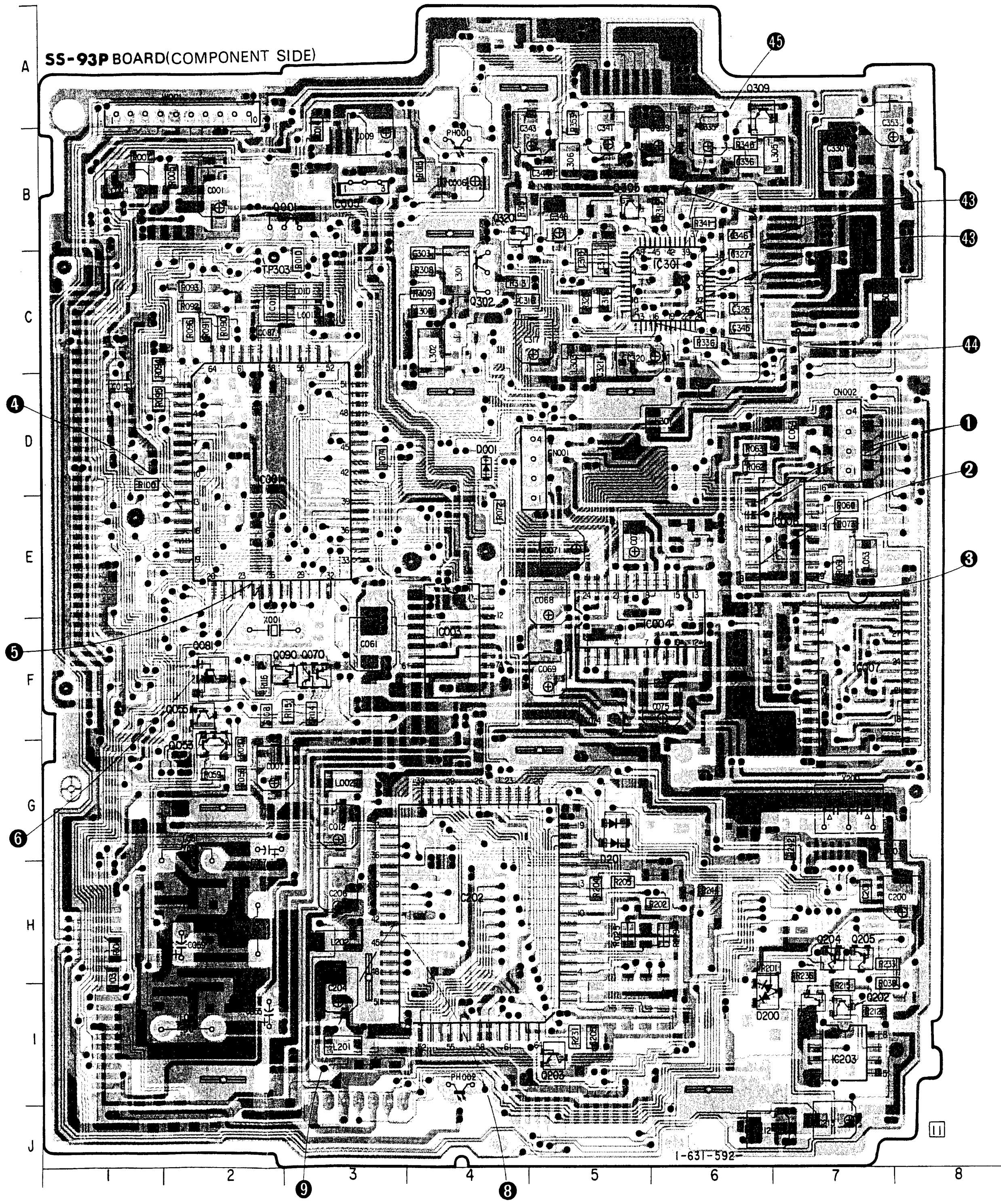

A
B
S550
WIND
J551
EXT MIC
DC OUT
CN551
C555
C563
C560
C558
21
J550
EXIT MIC

MC-36P BOARD (CONDUCTOR SIDE)

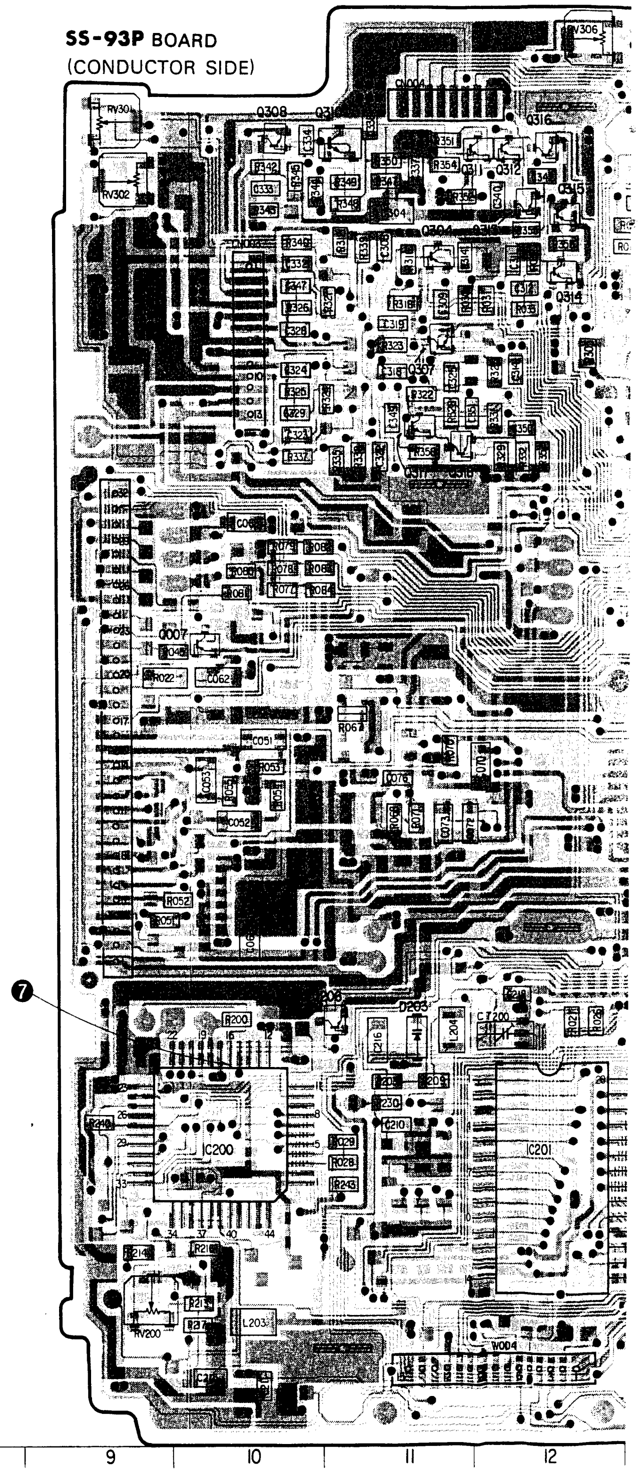

C
D
S552
START/STOP
559
1-630-449-
21
1
2
3
4
5

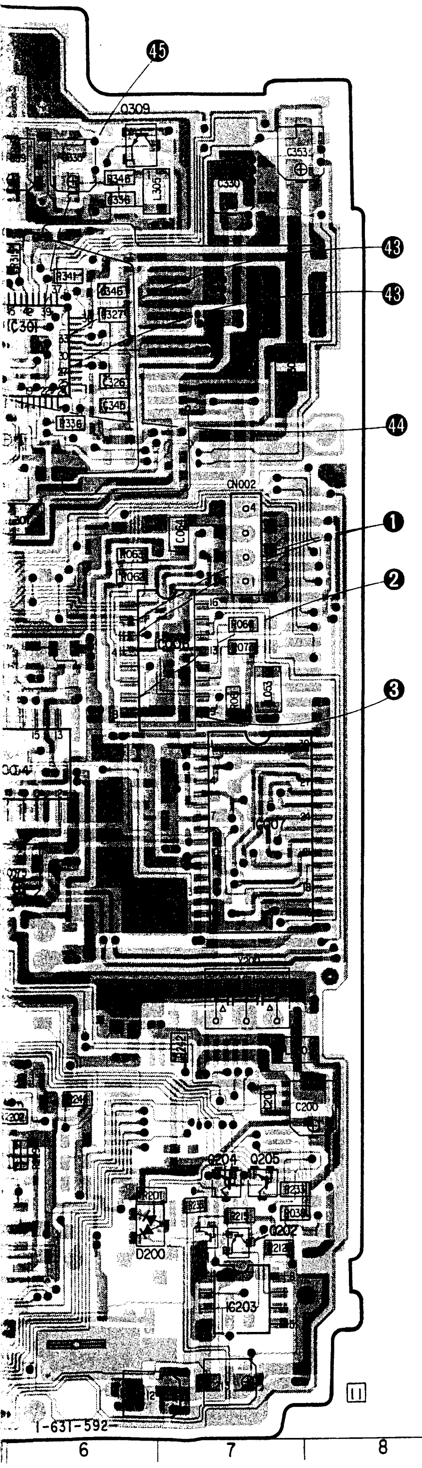
D001	D-4
D003	E-15
D004	E-15
D050	I-15
D051	H-15
D200	I-6
D201	G-5
D203	G-11
D399	F-14
IC001	D-2
IC002	B-15
IC003	F-4
IC004	F-5
IC005	B-3
IC006	E-7
IC007	F-7
IC200	H-10
IC201	H-12
IC202	H-4
IC203	I-7
IC301	C-6
Q001	B-3
Q002	B-14
Q005	B-13
Q006	G-14
Q007	E-10
Q008	G-14
Q051	I-15
Q052	H-15
Q053	G-2
Q054	E-6
Q055	F-2
Q070	F-3
Q071	F-15
Q073	F-15
Q074	F-15
Q075	C-15
Q076	F-14
Q078	F-14
Q079	F-15
Q080	F-14
Q081	F-2
Q090	F-2
Q201	I-7
Q202	I-7
Q203	I-5
Q204	H-7
Q205	H-7
Q206	G-11
Q302	C-4
Q303	C-13
Q304	B-11
Q305	B-5
Q307	C-11
Q308	A-10
Q309	A-6
Q310	A-11
Q311	A-12
Q312	A-12
Q313	B-12
Q314	B-12
Q315	B-12
Q316	A-12
Q317	C-11
Q318	C-11
Q319	D-14
Q320	B-4
Q321	F-15

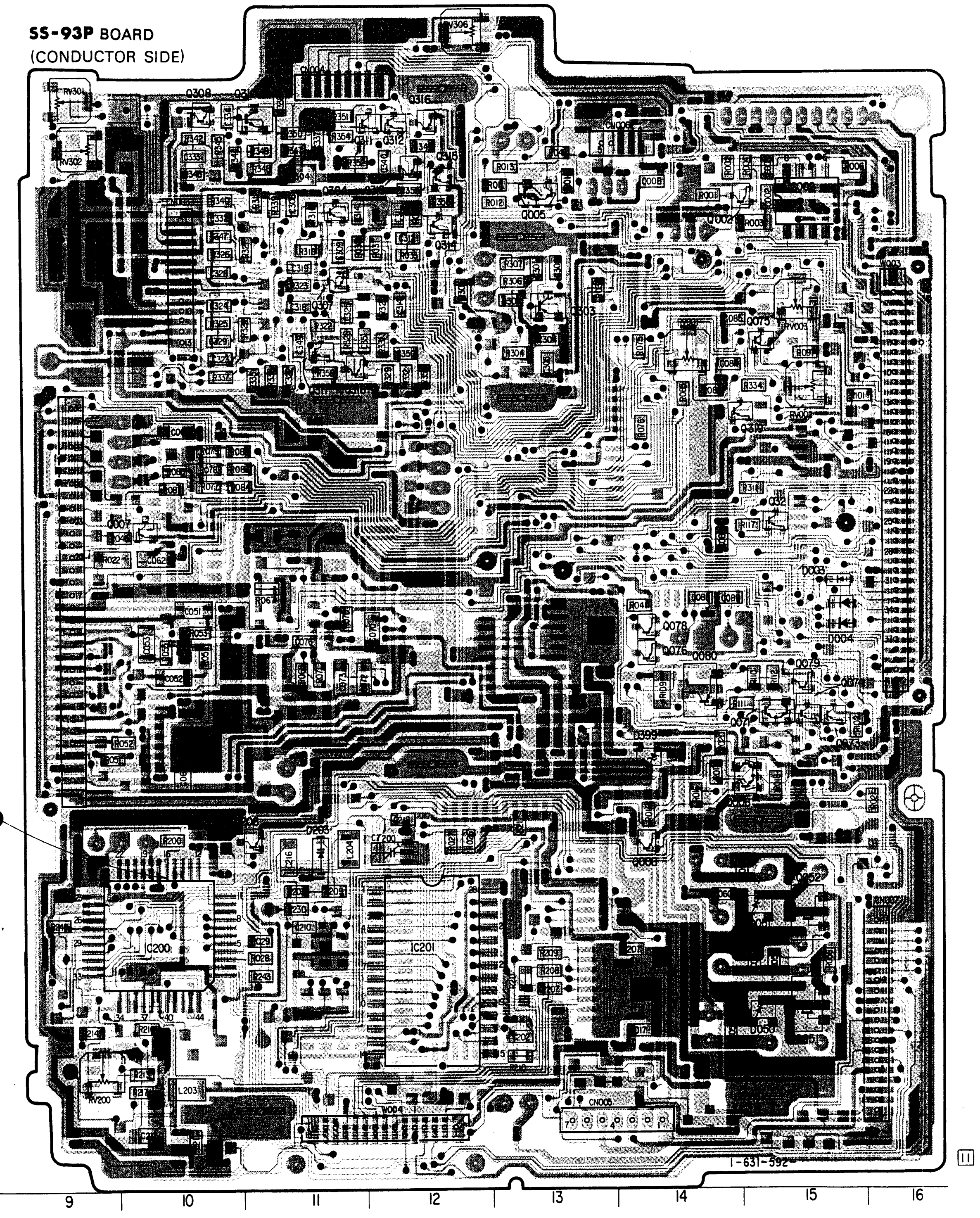
SS-93P BOARD(COMPONENT SIDE)


A
B
C
D
E
F
G
H
I
J
㊺
㊸
㊸
㊹
❶
❷
❸
❹
❺
❻
❽
❾
IC001
IC301
IC200
IC202
IC203
CN002
TP303
D001
Q309
PH001
PH002
L201
I-631-592
11
1
2
3
4
5
6
7
8

SS-93P BOARD (CONDUCTOR SIDE)


❼
RV302
Q308
IC200
IC201
L203
RV200
9
10
11
12

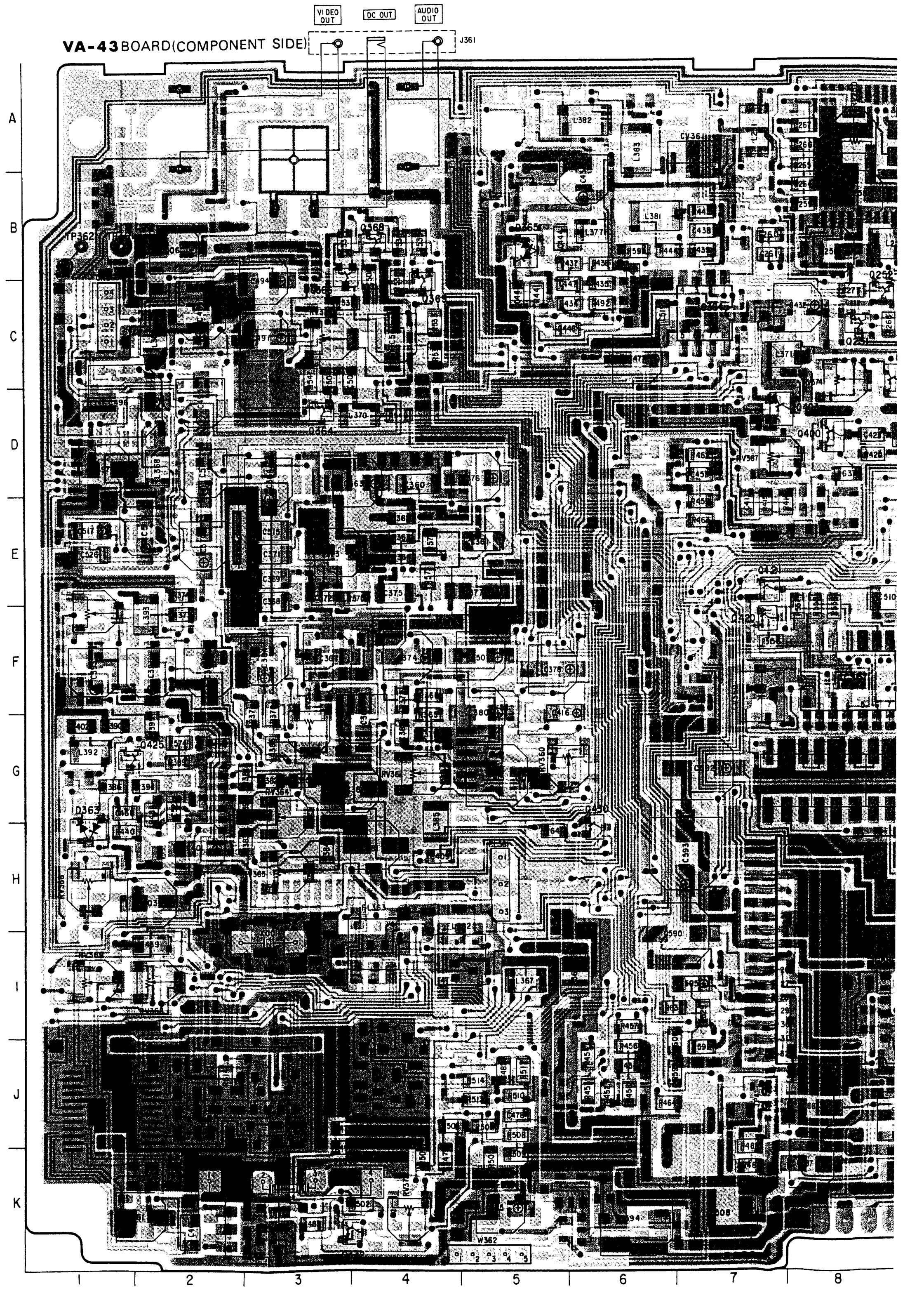

45
43
43
44
1
2
3
IC301
Q309
IC203
D200
C200
1-631-592
6
7
8


SS-93P BOARD
(CONDUCTOR SIDE)

7
RV301
RV302
Q306
Q308
Q316
Q005
IC200
IC201
L203
RV200
CN005
1-631-592
9
10
11
12
13
14
15
16

D361	E-15
D362	I-17
D363	H-1
D364	I-19
D365	B-5
D367	A-20
D368	B-19
D372	F-14
IC250	A-13
IC360	G-18
IC361	E-17
IC362	D-20
IC363	J-20
IC364	C-7
IC365	C-14
IC366	J-15
IC367	F-8
IC368	F-13
IC580	I-8
Q250	B-14
Q251	C-8
Q252	C-8
Q253	B-12
Q254	B-11
Q361	A-19
Q362	A-17
Q363	A-19
Q364	D-3
Q365	C-20
Q366	B-3
Q367	B-17
Q368	B-4
Q369	C-4
Q370	K-18
Q371	K-18
Q372	K-4
Q373	J-16
Q374	J-16
Q375	J-17
Q376	J-16
Q377	I-17
Q378	J-14
Q379	J-14
Q380	K-14
Q381	I-17
Q382	F-18
Q383	F-19
Q384	G-20
Q385	F-20
Q386	F-20
Q387	F-20
Q388	H-20
Q389	G-20
Q390	F-20
Q391	H-19
Q392	I-16
Q393	G-16
Q394	F-16
Q395	J-18
Q396	J-18
Q397	J-18
Q398	J-18
Q399	D-14
Q400	D-8
Q401	D-12
Q402	C-9
Q403	D-7
Q404	B-15
Q405	B-16
Q406	A-16
Q407	B-16
Q408	B-15
Q409	B-15
Q410	J-15
Q411	D-15
Q412	E-15
Q413	J-18
Q414	B-15
Q415	B-15
Q416	E-19
Q417	J-16
Q418	J-16
Q420	F-7
Q421	E-7
Q423	E-9
Q424	J-18
Q425	G-2
Q426	C-19
Q427	G-19
Q430	H-6
Q431	K-15
Q432	K-15
Q433	I-12
Q434	I-12
Q435	J-14
Q436	I-14
Q437	K-15
Q580	H-12
Q581	I-14
Q582	I-14
TPA	J-7

VA-43 BOARD(COMPONENT SIDE)


VIDEO OUT
DC OUT
AUDIO OUT
J361
TP362
L382
L381
Q364
Q440
D363
W362
A
B
C
D
E
F
G
H
I
J
K
1
2
3
4
5
6
7
8

E-15
I-17
H-1
I-19
B-5
A-20
B-19
F-14

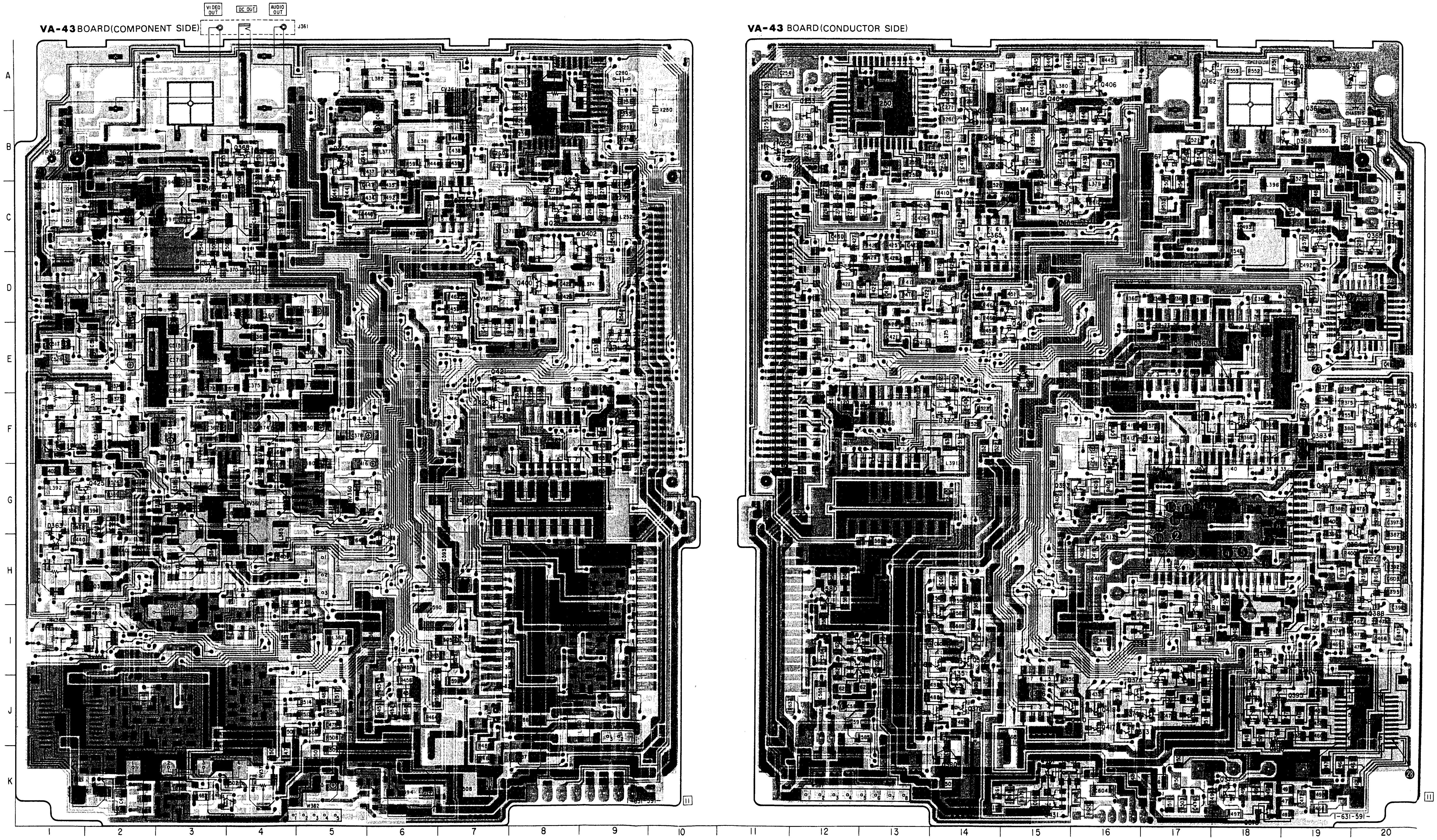
A-13
G-18
E-17
D-20
J-20
C-7
C-14
J-15
F-8
F-13
I-8

B-14
C-8
C-8
B-12
B-11
A-19
A-17
A-19
D-3
C-20
B-3
B-17
B-4
C-4
K-18
K-18
K-4
J-16
J-16
J-17
J-16
I-17
J-14
J-14
K-14
I-17
F-18
F-19
G-20
F-20
F-20
F-20
H-20
G-20
F-20
H-19
I-16
G-16
F-16
J-18
J-18
J-18
J-18
D-14
D-8
D-12
C-9
D-7
B-15
B-16
A-16
B-16
B-15
B-15
J-15
D-15
E-15
J-18
B-15
B-15
E-19
J-16
J-16
F-7
E-7
E-9
J-18
G-2
C-19

Q427	G-19
Q430	H-6
Q431	K-15
Q432	K-15
Q433	I-12
Q434	I-12
Q435	J-14
Q436	I-14
Q437	K-15
Q580	H-12
Q581	I-14
Q582	I-14
TPA	J-7

VA-43 BOARD(COMPONENT SIDE)

VA-43 BOARD(CONDUCTOR SIDE)


VIDEO OUT
DC OUT
AUDIO OUT
J361
A
B
C
D
E
F
G
H
I
J
K
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
1-631-591-

A

B

C

D

E

F

G

H

I

J

K

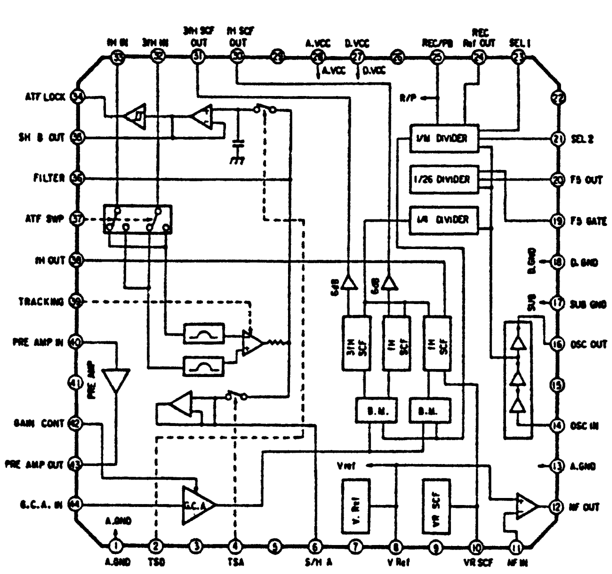
L

M

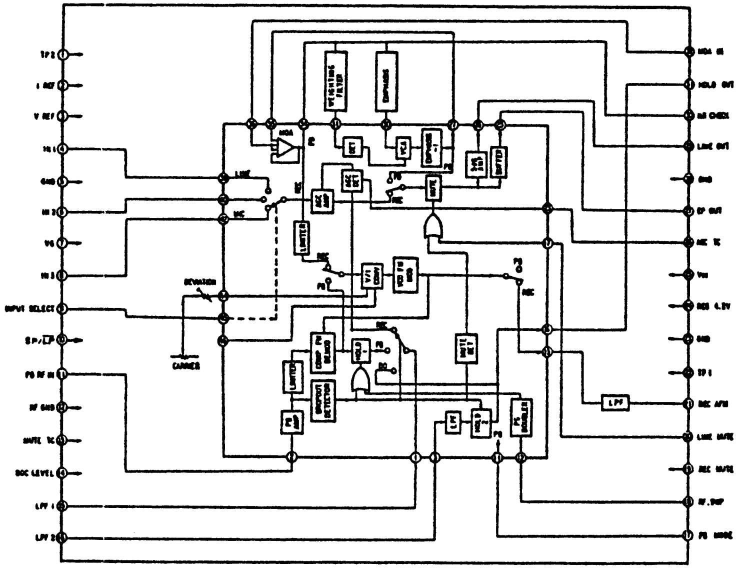
N

O

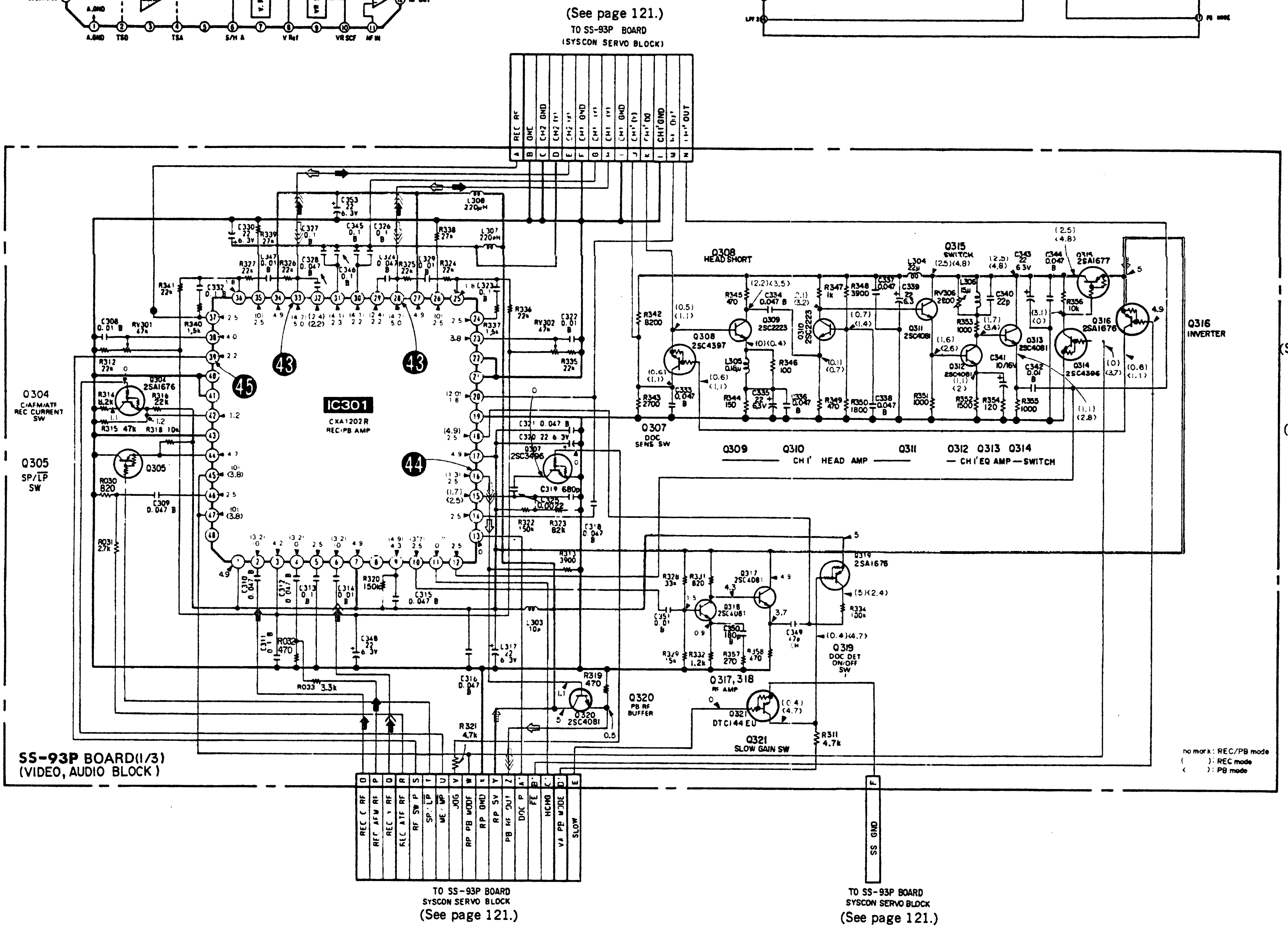
P



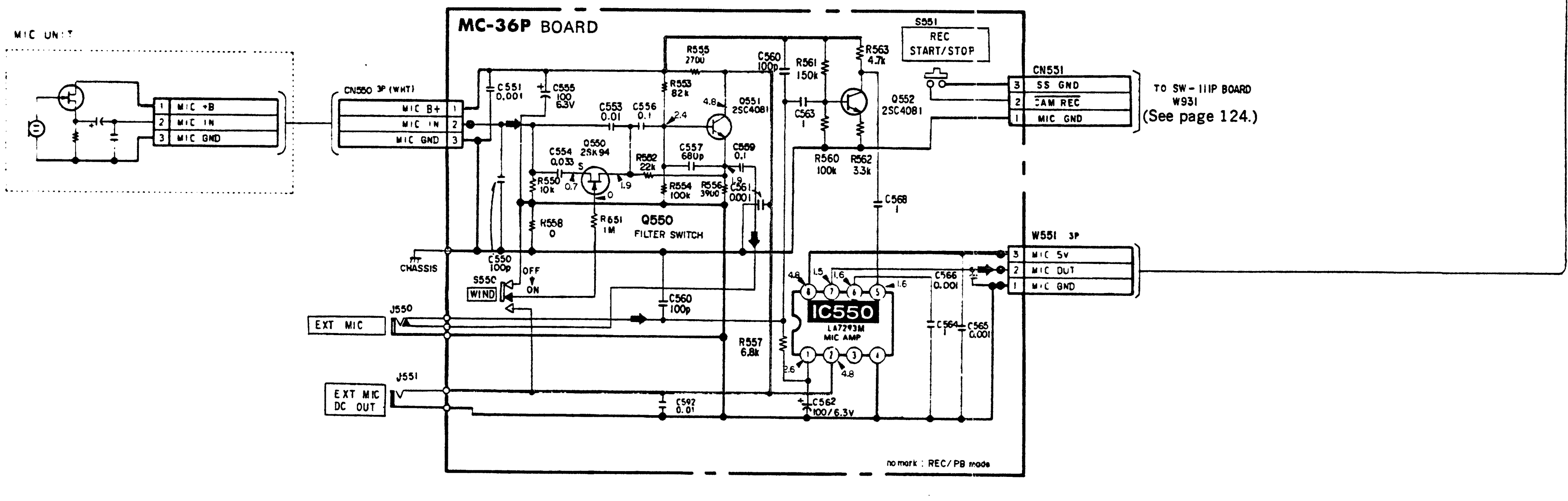
RH IN
3FH IN
3FH SCF OUT
FH SCF OUT
A.VCC
D.VCC
REC/PB
REC Ref OUT
SEL 1
ATF LOCK
SH B OUT
FILTER
ATF SWP
FH OUT
TRACKING
PRE AMP IN
PRE AMP
GAIN CONT
PRE AMP OUT
S.C.A. IN
R/P
1/M DIVIDER
1/26 DIVIDER
1/8 DIVIDER
SEL 2
FS OUT
FS GATE
D.GND
SUB GND
OSC OUT
OSC IN
A.GND
RF OUT
Vref
V. Ref
VR SCF
S.C.A
A.GND
TSD
TSA
S/H A
V Ref
VR SCF
RF IN



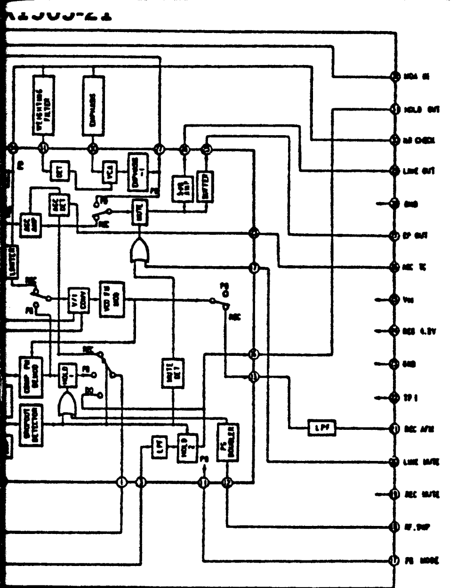
WEIGHTING FILTER
EMPHASIS
LPF
CARRIER
DEVIATION
INPUT SELECT
SP/LP
HOLD OUT
LINE OUT
GND
LINE IN



(See page 121.)
TO SS-93P BOARD
(SYSCON SERVO BLOCK)
REC RF
DHE
CH2 GND
CH2 (+)
CH2 (-)
CH1 GND
CH1 (+)
CH1 (-)
CH1' GND
CH1' (+)
CH1' GND
CH1' (-)
CH1' OUT
IC301
CXA1202R
REC/PB AMP
43
43
44
45
Q304
CHAFM/ATF REC CURRENT SW
Q305
SP/LP SW
Q308
HEAD SHORT
Q315
SWITCH
Q316
INVERTER
Q307
DOC SENS SW
Q309 Q310 CH1' HEAD AMP Q311
Q312 Q313 Q314 — CH1' EQ AMP—SWITCH
Q317,318
RF AMP
Q319
DOC DET ON/OFF SW
Q320
PB RF BUFFER
Q321
SLOW GAIN SW
SS-93P BOARD(1/3)
(VIDEO, AUDIO BLOCK)
no mark : REC/PB mode
( ) : REC mode
< > : PB mode
REC C RF
REC AFM RF
REC Y RF
REC ATF RF
RF SW P
SP/LP
WE JOG
RP PB MODE
RP GND
RP 5V
PB RF OUT
DOC P
FE
HCHB
VA PB MODE
SLOW
SS GND
TO SS-93P BOARD
SYSCON SERVO BLOCK
(See page 121.)
TO SS-93P BOARD
SYSCON SERVO BLOCK
(See page 121.)

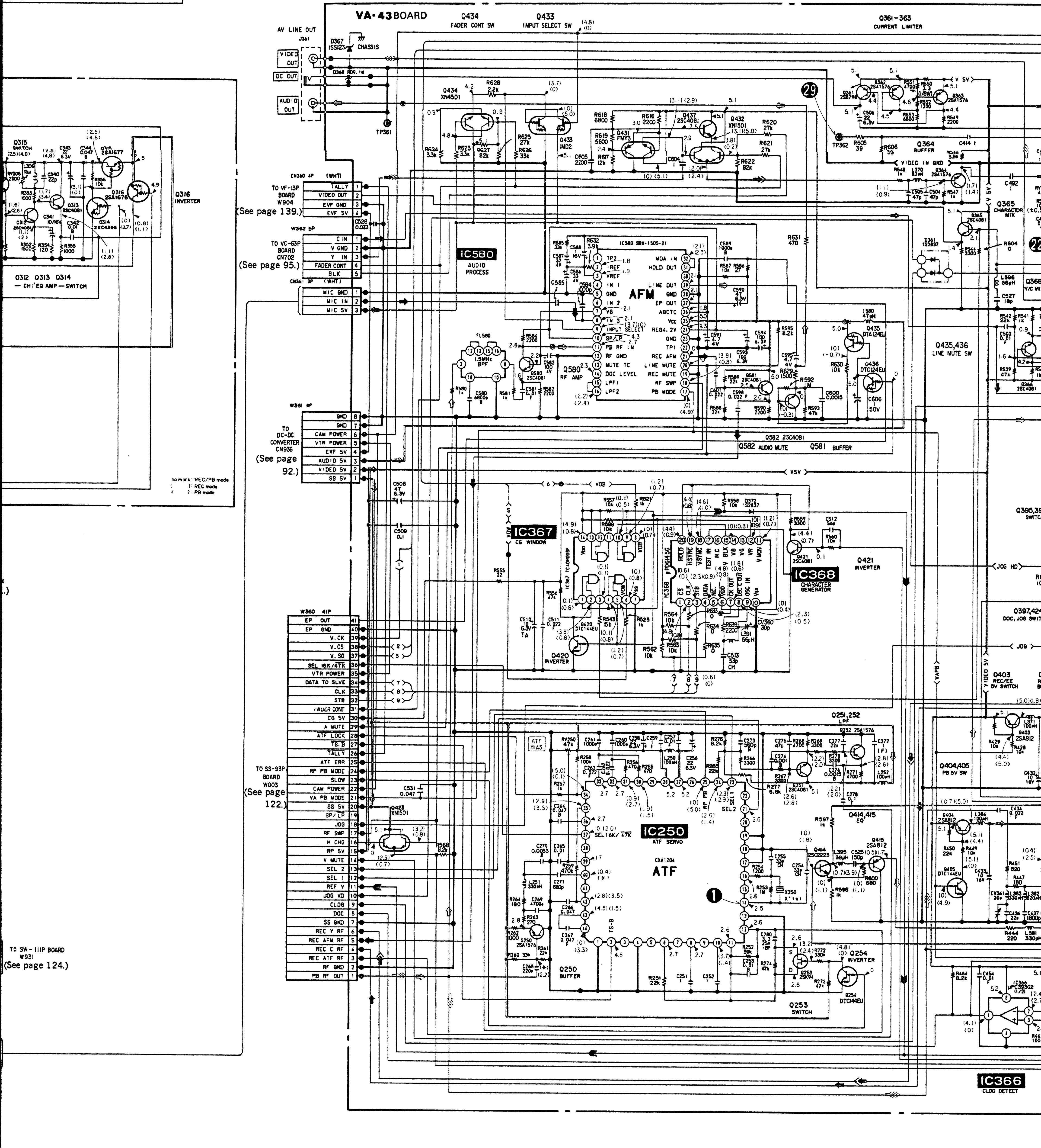


MIC UNIT
MIC +B
MIC IN
MIC GND
MC-36P BOARD
CN550 3P (WHT)
MIC B+
MIC IN
MIC GND
S551
REC START/STOP
CN551
SS GND
CAM REC
MIC GND
TO SW-111P BOARD
W931
(See page 124.)
Q550
FILTER SWITCH
CHASSIS
S550
WIND
OFF
ON
W551 3P
MIC 5V
MIC OUT
MIC GND
EXT MIC
J550
J551
EXT MIC DC OUT
IC550
LA7293M
MIC AMP
no mark : REC/PB mode

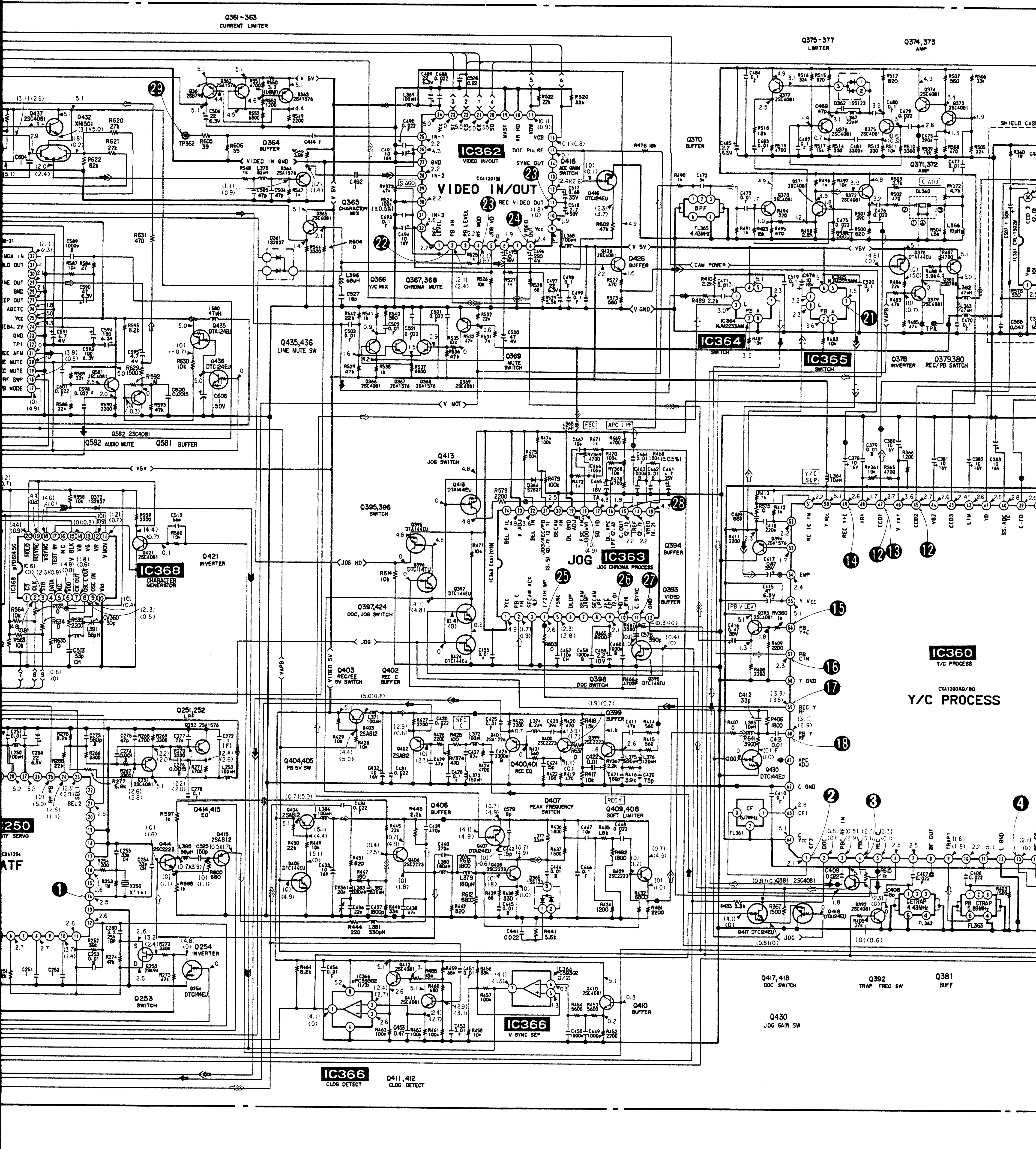


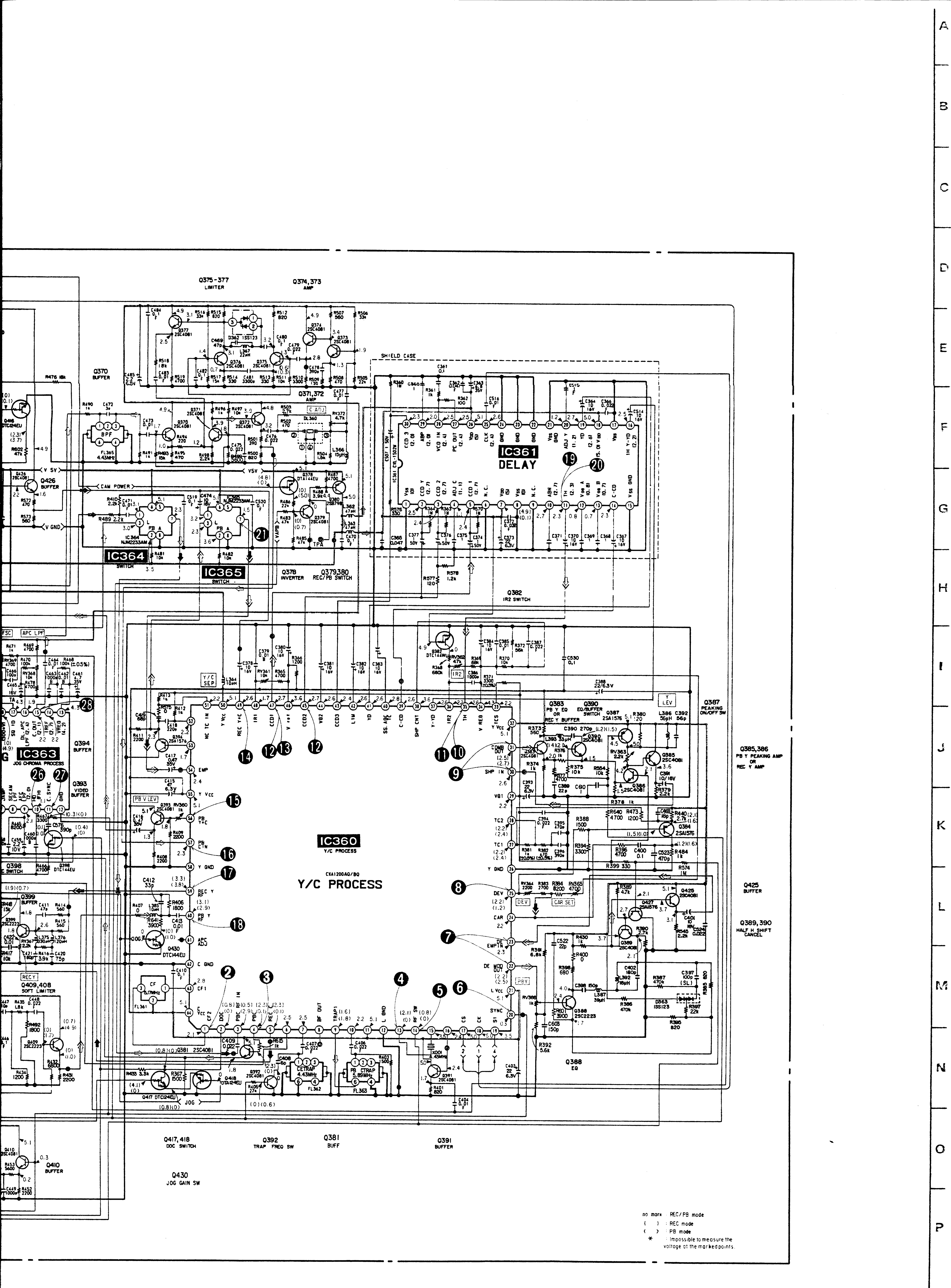
- ➡ : REC Y Signal
- ⇨ : PB Y Signal
- ➡ : REC CHROMA Signal
- ⇨ : PB CHROMA Signal
- ➡ : REC Y/CHROMA Signal
- ⇨ : PB Y/CHROMA Signal
- ➡ : REC AUDIO Signal
- ⇨ : PB AUDIO Signal

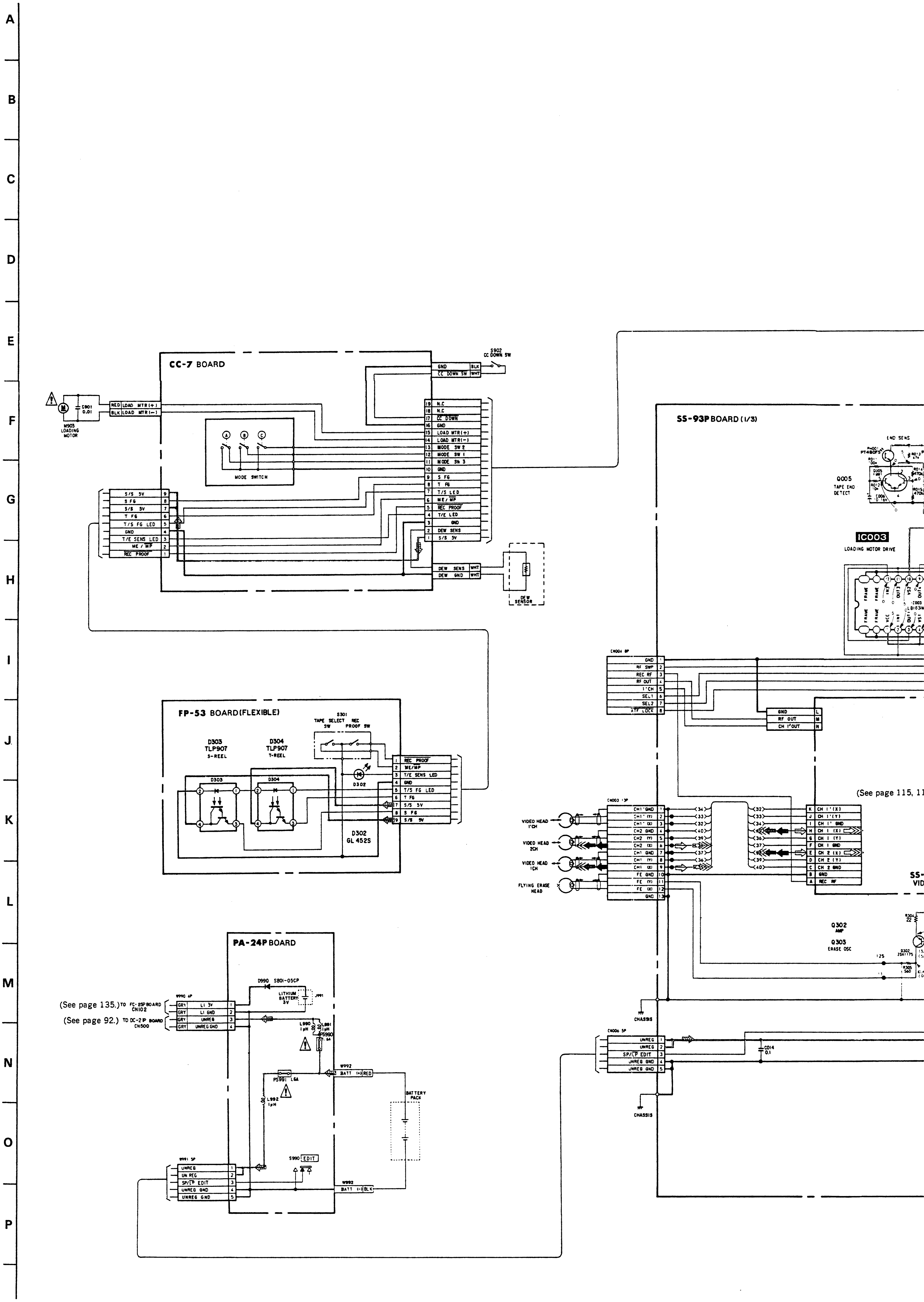
	REC	REC/PB	PB
Ref. signal	➡	⇨	⇨


VA-43 BOARD
AV LINE OUT
J361
VIDEO OUT
DC OUT
AUDIO OUT
CHASSIS
TP361
Q434 FADER CONT SW
Q433 INPUT SELECT SW
Q361-363 CURRENT LIMITER
Q364 BUFFER
Q365 CHARACTOR MIX
TO VF-13P BOARD W904 (See page 139.)
TALLY
VIDEO OUT
EVF GND
EVF 5V
TO VC-63P BOARD CN702 (See page 95.)
C IN
V GND
Y IN
FADER CONT
BLK
MIC AMP
MIC IN
MIC 5V
IC580 AUDIO PROCESS
IC580 SBX-1505-21
AFM
Q580 RF AMP
FL580 1.5MHz BPF
Q582 AUDIO MUTE
Q581 BUFFER
Q435,436 LINE MUTE SW
TO DC-DC CONVERTER CN936 (See page 92.)
GND
CAM POWER
VTR POWER
EVF 5V
AUDIO 5V
VIDEO 5V
SS 5V
no mark : REC/PB mode
( ) : REC mode
< > : PB mode
IC367 CG WINDOW
Q420 INVERTER
IC368 CHARACTER GENERATOR
Q421 INVERTER
W360 41P
TO SS-93P BOARD W003 (See page 122.)
TO SW-111P BOARD W931 (See page 124.)
EP OUT
EP GND
V.CK
V.CS
V.SO
SEL 16K/47K
VTR POWER
DATA TO SLVE
CLK
STB
FADER CONT
CG 5V
A MUTE
ATF LOCK
TS.B
TALLY
ATF ERR
RP PB MODE
SLOW
CAM POWER
VA PB MODE
SS 5V
SP/LP
JOG
RF SWP
H CHG
RP 5V
V MUTE
SEL 2
SEL 1
REF V
JOG VD
CLOG
DOC
SS GND
REC Y RF
REC AFM RF
REC C RF
REC ATF RF
RF GND
PB RF OUT
IC250 ATF SERVO
CXA1204
ATF
ATF BIAS
Q251,252 LPF
Q250 BUFFER
Q253 SWITCH
Q254 INVERTER
Q414,415 EQ
Q404,405 PB 5V SW
Q403 REC/EE 5V SWITCH
Q395,396 SWITCH
Q397,424 DOC, JOG SWITCH
IC366 CLOG DETECT
Q315 SWITCH
Q316 INVERTER
Q312 Q313 Q314 — CH1'EQ AMP—SWITCH
29
22
1

REC	REC/PB	PB
➤	➤	▷


Q361-363 CURRENT LIMITER
Q375-377 LIMITER
Q374,373 AMP
SHIELD CASE
Q370 BUFFER
Q371,372 AMP
Q364 BUFFER
Q365 CHARACTOR MIX
IC362 VIDEO IN/OUT
CXA1201M
VIDEO IN/OUT
Q416 AGC GAIN SWITCH
Q426 BUFFER
Q366 Y/C MIX
Q367,368 CHROMA MUTE
Q369 MUTE SWITCH
Q435,436 LINE MUTE SW
Q582 AUDIO MUTE
Q581 BUFFER
IC364 SWITCH
IC365 SWITCH
Q378 INVERTER
Q379,380 REC/PB SWITCH
Q413 JOG SWITCH
Q395,396 SWITCH
IC363 JOG CHROMA PROCESS
JOG
Q394 BUFFER
Q393 VIDEO BUFFER
Q397,424 DOC, JOG SWITCH
Q398 DOC SWITCH
Q403 REC/EE 5V SWITCH
Q402 REC C BUFFER
IC368 CHARACTER GENERATOR
Q421 INVERTER
Q251,252 LPF
Q404,405 PB 5V SW
Q400,401 REC EQ
Q399 BUFFER
Q414,415 EQ
Q406 BUFFER
Q407 PEAK FREQUENCY SWITCH
Q409,408 SOFT LIMITER
IC250 ATF SERVO
CXA1204
ATF
Q254 INVERTER
Q253 SWITCH
IC366 V SYNC SEP
Q410 BUFFER
IC366 CLOG DETECT
Q411,412 CLOG DETECT
IC360 Y/C PROCESS
CXA1200AQ/BQ
Y/C PROCESS
Q417,418 DOC SWITCH
Q392 TRAP FREQ SW
Q381 BUFF
Q430 JOG GAIN SW
FL361 FL362 FL363 FL365
CETRAP 4.43MHz
PB CTRAP 5.69MHz
BPF

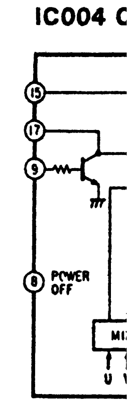

A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q375-377 LIMITER
Q374,373 AMP
Q370 BUFFER
Q371,372 AMP
SHIELD CASE
BPF
FL365 4.43MHz
DL360
C ADJ
Q426 BUFFER
V 5V
CAM POWER
V GND
IC364 NJM2233AM
IC364 SWITCH
IC365 NJM2233AM
IC365 SWITCH
Q378 INVERTER
Q379,380 REC/PB SWITCH
TPA
IC361 DELAY
IC361 CXL1502M
Q382 IR2 SWITCH
IC363 JOG CHROMA PROCESS
Q394 BUFFER
Q393 VIDEO BUFFER
Q398 SWITCH
Q399 BUFFER
Q409,408 SOFT LIMITER
Q410 BUFFER
IC360 Y/C PROCESS
CXA1200AQ/BQ
Y/C PROCESS
Y/C SEP
PB V LEV
Y LEV
IR2
DEV
CAR SET
PBY
CF 5.7MHz
FL361
CETRAP 4.43MHz
FL362
PB CTRAP 5.89MHz
FL363
X001 4.43MHz
JOG
Q383 PB Y EQ OR REC Y BUFFER
Q390 EQ/BUFFER SWITCH
Q387 PEAKING ON/OFF SW
Q385,386 PB Y PEAKING AMP OR REC Y AMP
Q384
Q425 BUFFER
Q389,390 HALF H SHIFT CANCEL
Q388 EQ
Q417,418 DOC SWITCH
Q392 TRAP FREQ SW
Q381 BUFF
Q391 BUFFER
Q430 JOG GAIN SW
no mark : REC/PB mode
( ) : REC mode
< > : PB mode
* : Impossible to measure the voltage of the marked points.


A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
CC-7 BOARD
S902 CC DOWN SW
M903 LOADING MOTOR
C901 0.01
MODE SWITCH
DEW SENSOR
FP-53 BOARD(FLEXIBLE)
S301 TAPE SELECT SW
REC PROOF SW
D303 TLP907 S-REEL
D304 TLP907 T-REEL
D302 GL452S
PA-24P BOARD
D990 S801-05CP
LITHIUM BATTERY 3V
(See page 135.) TO FC-25P BOARD CN102
(See page 92.) TO DC-21P BOARD CN500
BATTERY PACK
S990 EDIT
SS-93P BOARD (1/3)
Q005 TAPE END DETECT
IC003 LOADING MOTOR DRIVE
VIDEO HEAD 1'CH
VIDEO HEAD 2CH
VIDEO HEAD 1CH
FLYING ERASE HEAD
Q302 AMP
Q303 ERASE OSC
CHASSIS
(See page 115, 11

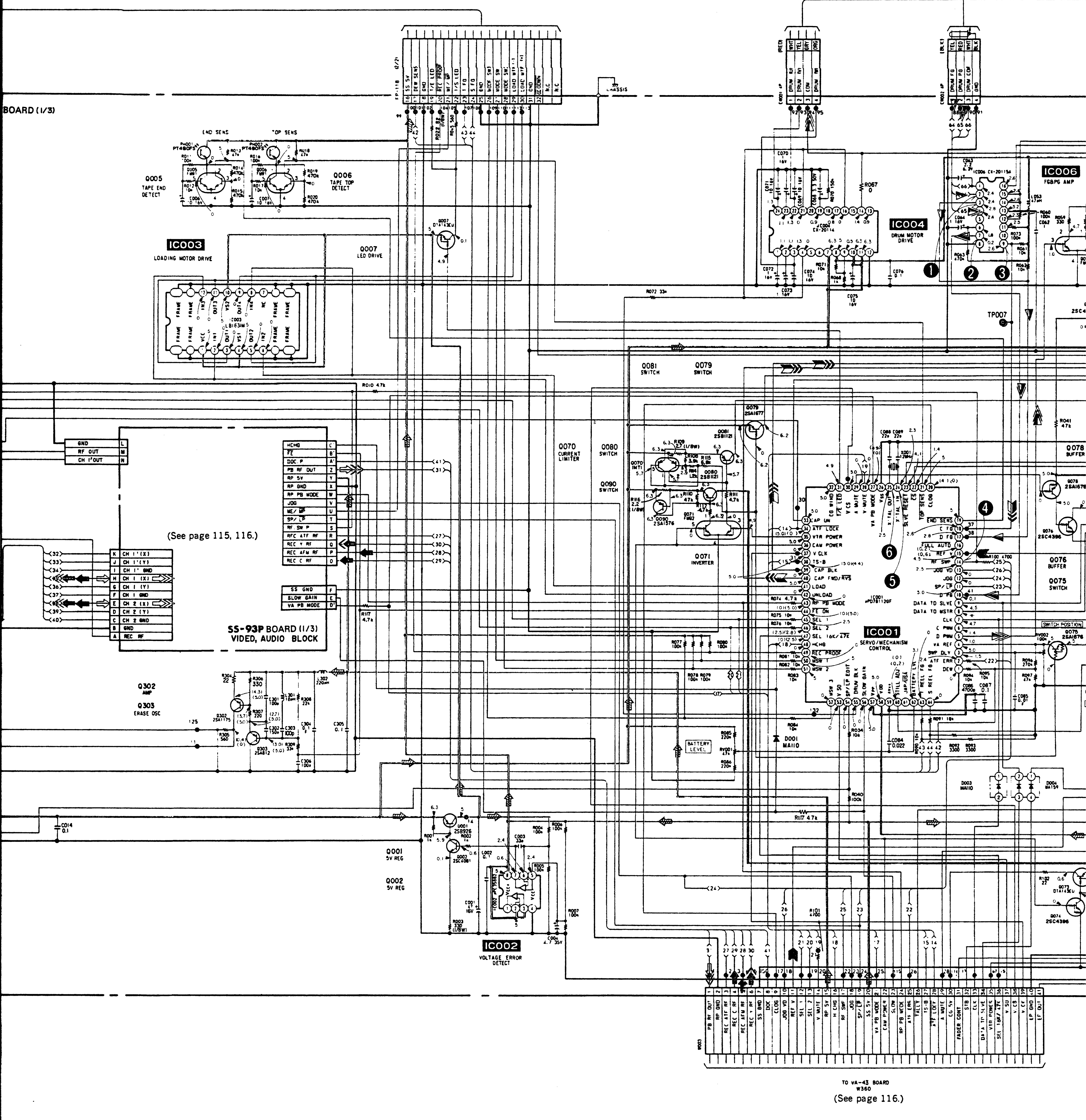
➡ : REC Y Signal
➡ : REC CHROMA Signal
➡ : REC Y/CHROMA Signal
⇨ : PB Y/CHROMA Signal
➡ : REC AUDIO Signal
⇨ : PB AUDIO Signal

Signal path

	REC	REC/PB	PB
Drum speed servo		▷	
Drum phase servo		▷	
Drum servo (speed and phase)		▷	
Capstan servo (speed and phase)		▷	
Ref. signal	➡	▷	▷

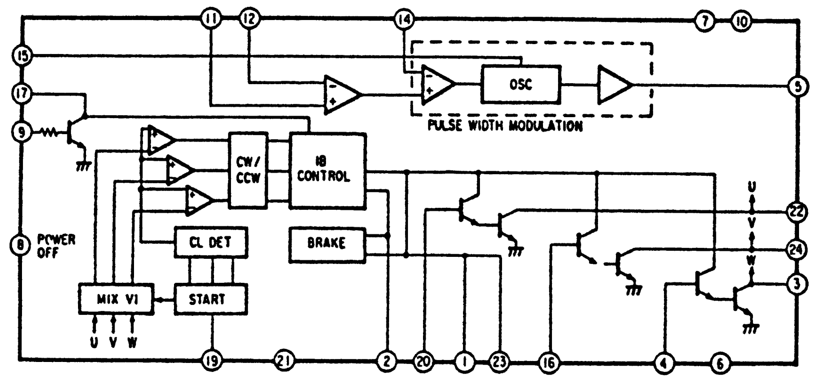


IC004 C
15
17
9
8
POWER OFF

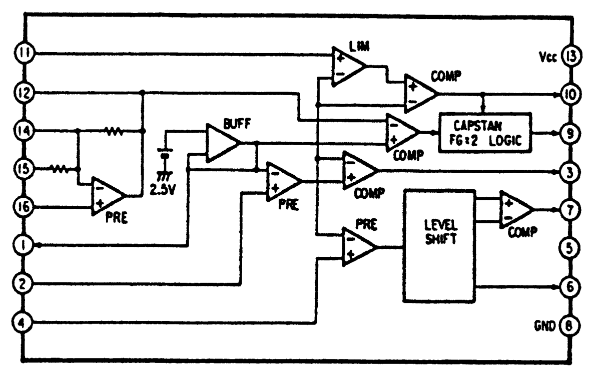


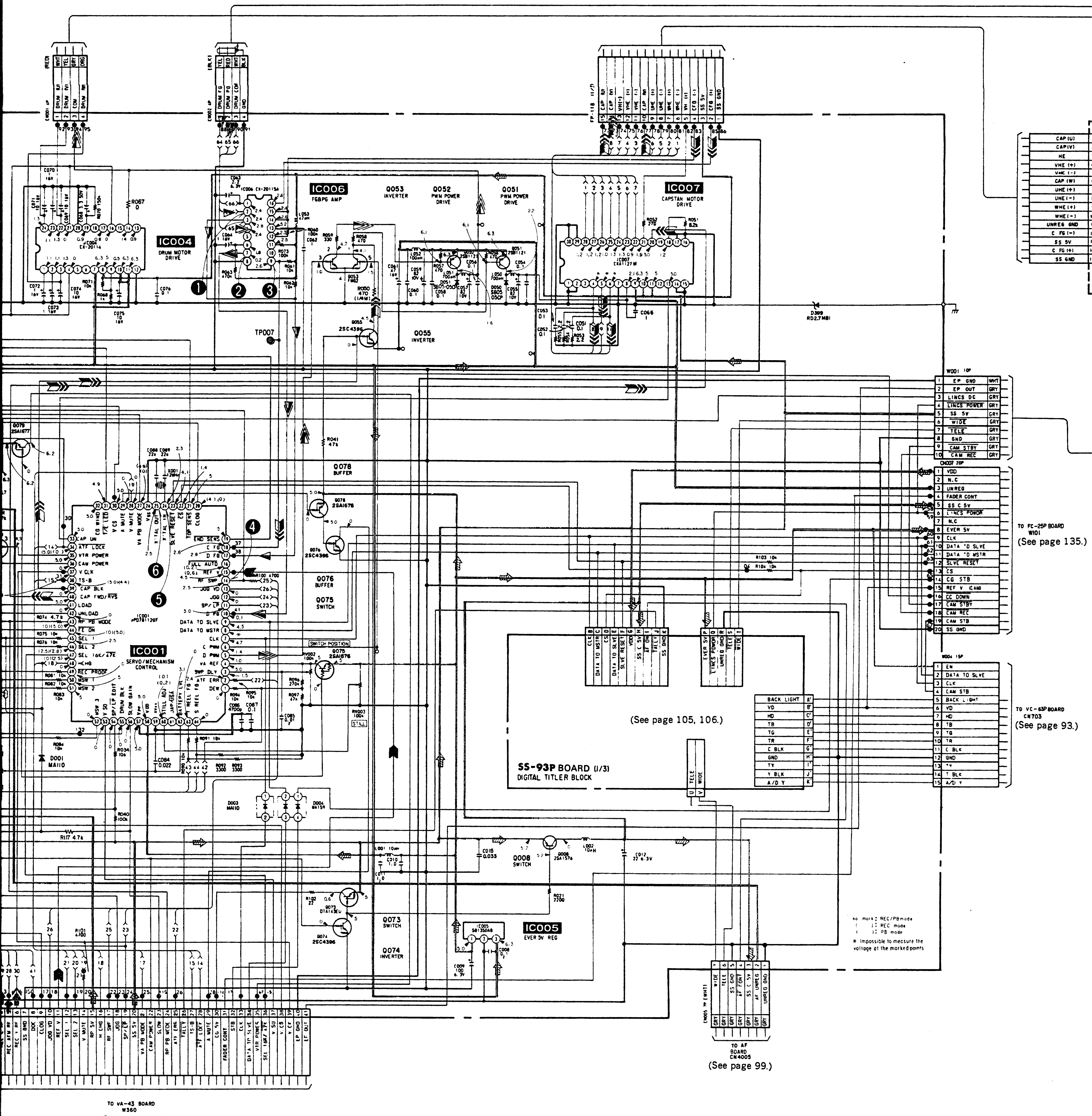
BOARD (1/3)
END SENS
TOP SENS
Q005 TAPE END DETECT
Q006 TAPE TOP DETECT
IC003
LOADING MOTOR DRIVE
Q007 LED DRIVE
FRAME
VCC
OUT1
OUT2
VS1
VS2
IN1
IN2
NC
LB1638M
FP-118
SS 5V
DEW SENS
GND
T/E LED
REC PROOF
WF/WP
T/S LED
S FG
WODE SW
LOAD MTR
GND
CG DOWN
N.C
CHASSIS
CN001
DRUM FG
DRUM PG
COM
GND
RED
WHT
YEL
GRY
ORG
BLK
IC004
DRUM MOTOR DRIVE
IC006
FGBPG AMP
TP007
R072 33k
R010 4.7k
Q081 SWITCH
Q079 SWITCH
Q070 CURRENT LIMITER
Q080 SWITCH
Q090 SWITCH
Q071 INVERTER
Q078 BUFFER
Q076 BUFFER
Q075 SWITCH
GND
RF OUT
CH 1' OUT
HCHG
FE
DOC P
PB RF OUT
RP 5V
RP GND
RP PB MODE
JOG
ME/MP
SP/LP
RF SW P
RFC ATF RF
REC Y RF
REC AFM RF
REC C RF
SS GND
SLOW GAIN
VA PB MODE
(See page 115, 116.)
CH 1' (X)
CH 1' (Y)
CH 1' GND
CH 1 (X)
CH 1 (Y)
CH 1 GND
CH 2 (X)
CH 2 (Y)
CH 2 GND
GND
REC RF
SS-93P BOARD (1/3)
VIDEO, AUDIO BLOCK
IC001
SERVO/MECHANISM CONTROL
µPD78112OF
CAP ON
ATF LOCK
VTR POWER
CAM POWER
V CLK
TS-B
CAP BLK
CAP FWD/RVS
LOAD
UNLOAD
RP PB MODE
FE ON
SEL 1
SEL 2
SEL 16K/47K
HCHG
REC PROOF
MSW 1
MSW 2
END SENS
C FG
D FG
FULL AUTO
RF SWP
JOG VD
JOG
SP/LP
D PFB
DATA TO SLVE
DATA TO MSTR
CLK
C PWM
D PWM
VA REF
SWP DLY
ATF ERR
DEW
BATTERY LEVEL
D001 MA110
Q302 AMP
Q303 ERASE OSC
Q001 5V REG
Q002 5V REG
IC002
VOLTAGE ERROR DETECT
D003 MA110
D004 MA154
SWITCH POSITION
R117 4.7k
PB RF OUT
RP GND
REC ATF RF
REC C RF
REC AFM RF
REC Y RF
GND
DOC
CLOG
JOG VD
REF V
SEL 1
SEL 2
V MUTE
RP 5V
H CHG
RF SWP
SP/LP
SS 5V
VA PB MODE
CAM POWER
RP PB MODE
ATF LOCK
TS-B
A MUTE
CG 5V
FADER CONT
STB
CLK
DATA TO SLVE
VTR POWER
SEL 16K/47K
V SU
V CS
EP GND
EP 5V
TO VA-43 BOARD W360
(See page 116.)

IC004 CX20114


PULSE WIDTH MODULATION
OSC
CW/CCW
IB CONTROL
CL DET
BRAKE
MIX VI
START
POWER OFF
U V W

IC006 CX20115A


LIM
COMP
Vcc
CAPSTAN FG÷2 LOGIC
BUFF
PRE
2.5V
LEVEL SHIFT
GND


IC004
DRUM MOTOR DRIVE
IC006
FGBPG AMP
Q053 INVERTER
Q052 PWM POWER DRIVE
Q051 PWM POWER DRIVE
IC007
CAPSTAN MOTOR DRIVE
Q055 INVERTER
TP007
IC001
SERVO/MECHANISM CONTROL
Q078 BUFFER
Q076 BUFFER
Q075 SWITCH
SWITCH POSITION
STILL
Q008 SWITCH
Q073 SWITCH
Q074 INVERTER
IC005
EVER 5V REG
SS-93P BOARD (1/3)
DIGITAL TITLER BLOCK
W001 10P
CN007 20P
W004 15P
TO FC-25P BOARD W101
TO VC-63P BOARD CN703
TO AF BOARD CN4005
TO VA-43 BOARD W360

(See page 135.)

(See page 105, 106.)

(See page 93.)

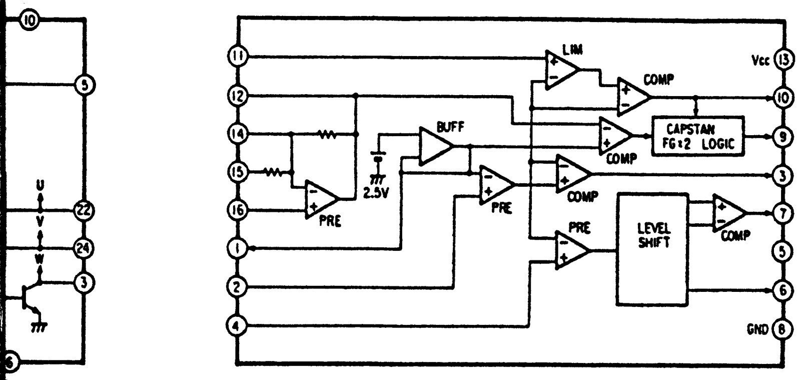
no mark : REC/PB mode
( ) : REC mode
< > : PB mode
* Impossible to measure the voltage at the marked points

(See page 99.)

(See page 116.)

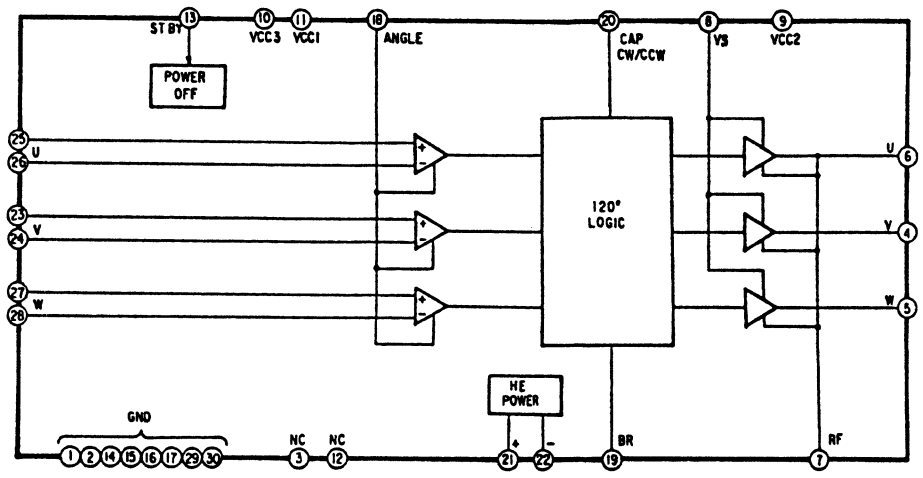
SERVO/SYSTEM CONTROL SERVO/S

IC006 CX20115A

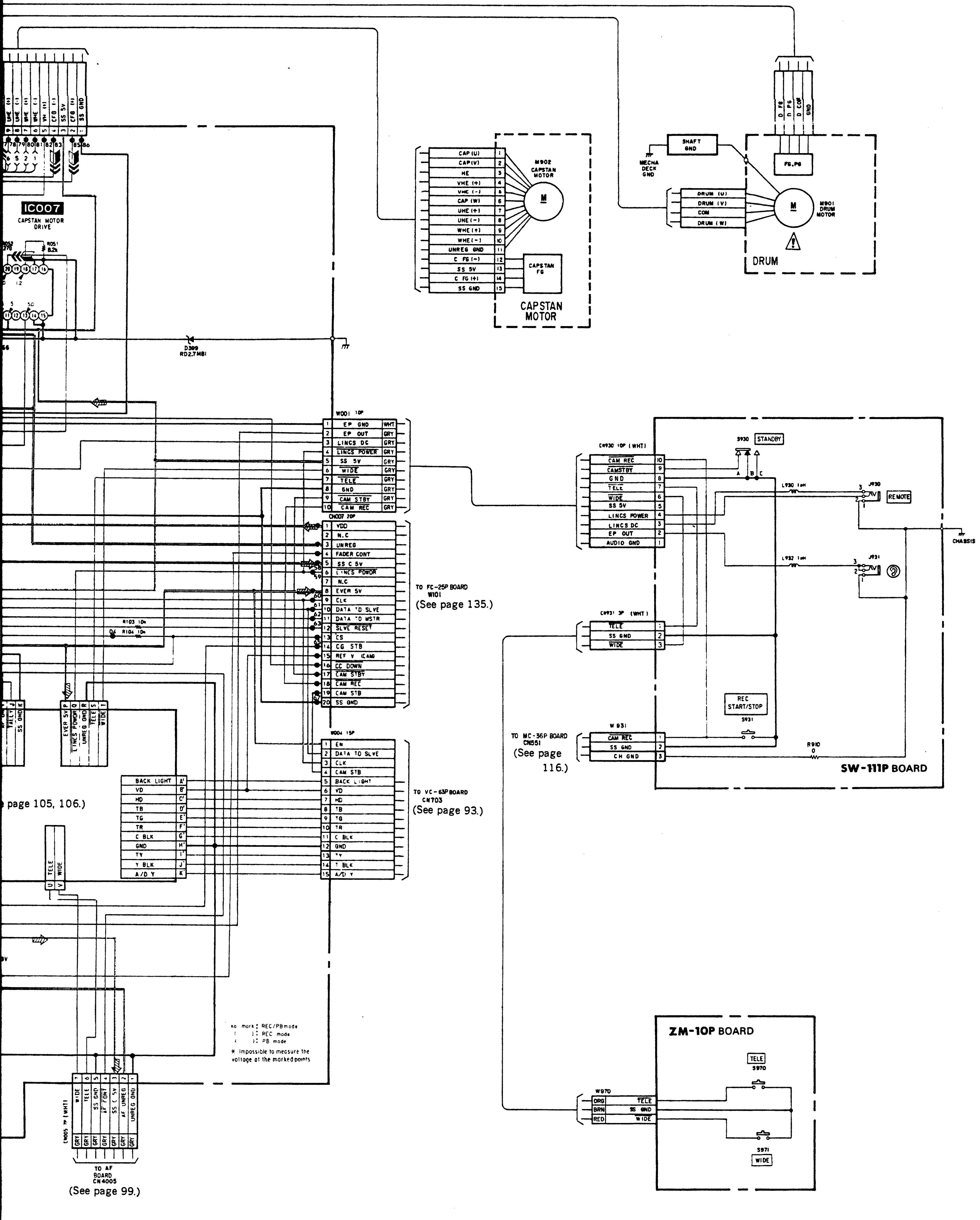


LIM
COMP
BUFF
CAPSTAN FG÷2 LOGIC
2.5V
PRE
LEVEL SHIFT
Vcc
GND
U
V

IC007 CXA1127M

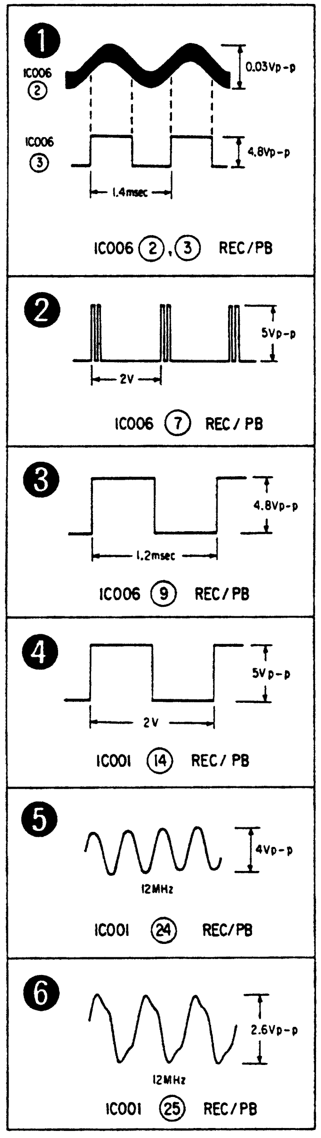


STBY
POWER OFF
VCC3
VCC1
ANGLE
CAP CW/CCW
V3
VCC2
U
V
W
120° LOGIC
HE POWER
GND
NC
NC
BR
RF



IC007
CAPSTAN MOTOR DRIVE
D309 RD2.7MB1
M902 CAPSTAN MOTOR
CAP (U)
CAP (V)
HE
VHE (+)
VHE (−)
CAP (W)
UHE (+)
UHE (−)
WHE (+)
WHE (−)
UNREG GND
C FG (−)
SS 5V
C FG (+)
SS GND
CAPSTAN FG
CAPSTAN MOTOR
SHAFT GND
MECHA DECK GND
FG, PG
D FG
D PG
D COM
GND
DRUM (U)
DRUM (V)
COM
DRUM (W)
M901 DRUM MOTOR
DRUM
W001 10P
EP GND
EP OUT
LINCS DC
LINCS POWER
SS 5V
WIDE
TELE
GND
CAM STBY
CAM REC
CN007 20P
VDD
N.C
UNREG
FADER CONT
SS C 5V
LINCS POWER
N.C
EVER 5V
CLK
DATA TO SLVE
DATA TO MSTR
SLVE RESET
CS
CG STB
REF V
CC DOWN
CAM STBY
CAM REC
CAM STB
SS GND
TO FC-25P BOARD W101
(See page 135.)
R103 10k
R104 10k
W004 15P
EN
DATA TO SLVE
CLK
CAM STB
BACK LIGHT
VD
HD
TB
TG
TR
C BLK
GND
TY
Y BLK
A/D Y
TO VC-63P BOARD CN703
(See page 93.)
page 105, 106.)
EVER 5V
LINCS POWER
UNREG GND
TELE
WIDE
TELE
WIDE
CN930 10P (WHT)
CAM REC
CAMSTBY
GND
TELE
WIDE
SS 5V
LINCS POWER
LINCS DC
EP OUT
AUDIO GND
S930 STANDBY
L930 1mH
J930
REMOTE
L932 1mH
J931
CHASSIS
CN931 3P (WHT)
TELE
SS GND
WIDE
REC START/STOP
S931
W931
CAM REC
SS GND
CH GND
R910 0
TO MC-36P BOARD CN551
(See page 116.)
SW-111P BOARD
no mark : REC/PB mode
( ) : REC mode
( ) : PB mode
* : Impossible to measure the voltage at the marked points
ZM-10P BOARD
TELE
S970
W970
ORG
BRN
RED
TELE
SS GND
WIDE
S971
WIDE
CN005 7P (WHT)
WIDE
TELE
SS GND
SS C 5V
AF UNREG
AF UNREG GND
GRY
TO AF BOARD CN4005
(See page 99.)

SS-93P BOARD

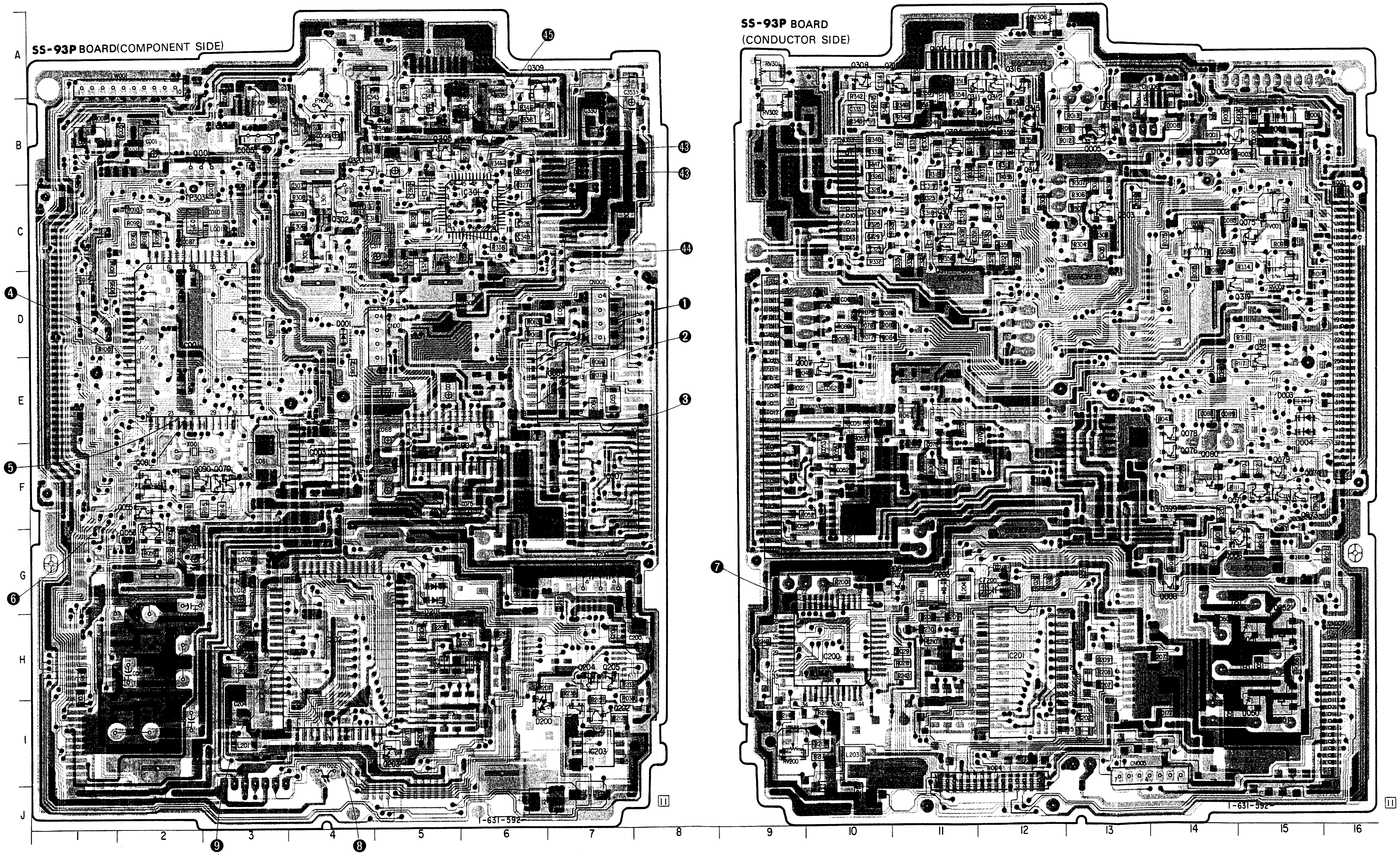


SERVO/SYSTEM CONTROL SERVO/SYSTEM CONTROL

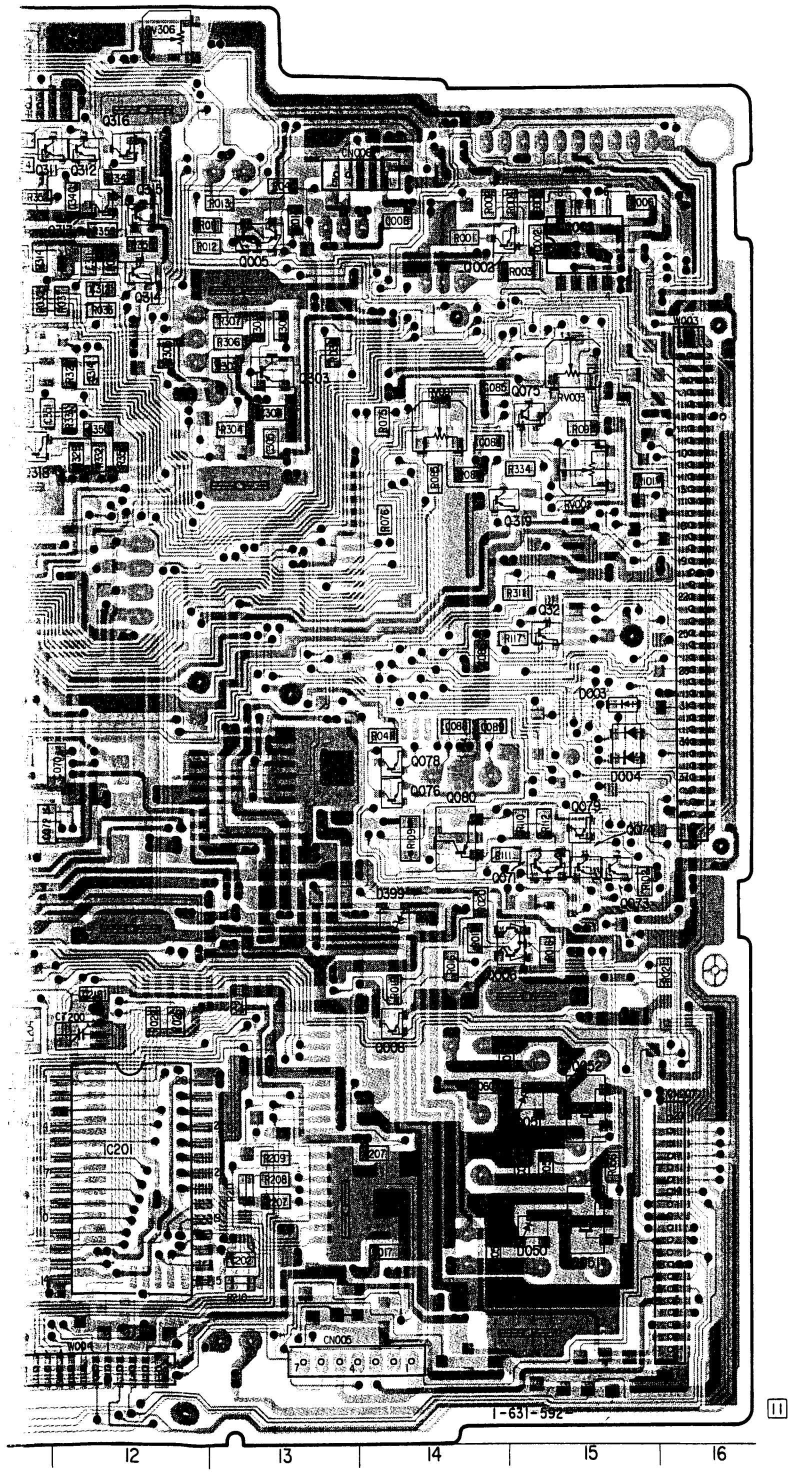
SS-93P (SERVO/SYSTEM CONTROL), SW-111P (START/STOP SWITCH, STANDBY SWITCH, IN/OUT JACK), ZM-10P (ZOOM SWITCH), PA-24P (POWER), CC-7 (MODE SWITCH), FP-53 (TAPE SELECT/CASSETTE IN SWITCH) PRINTED WIRING BOARDS

—Ref. No. SS-93P BOARD ; 2,000 series, SW-111P, ZM-10P, PA-24P, CC-7, FP-53 BOARDS ; 3,000 series—

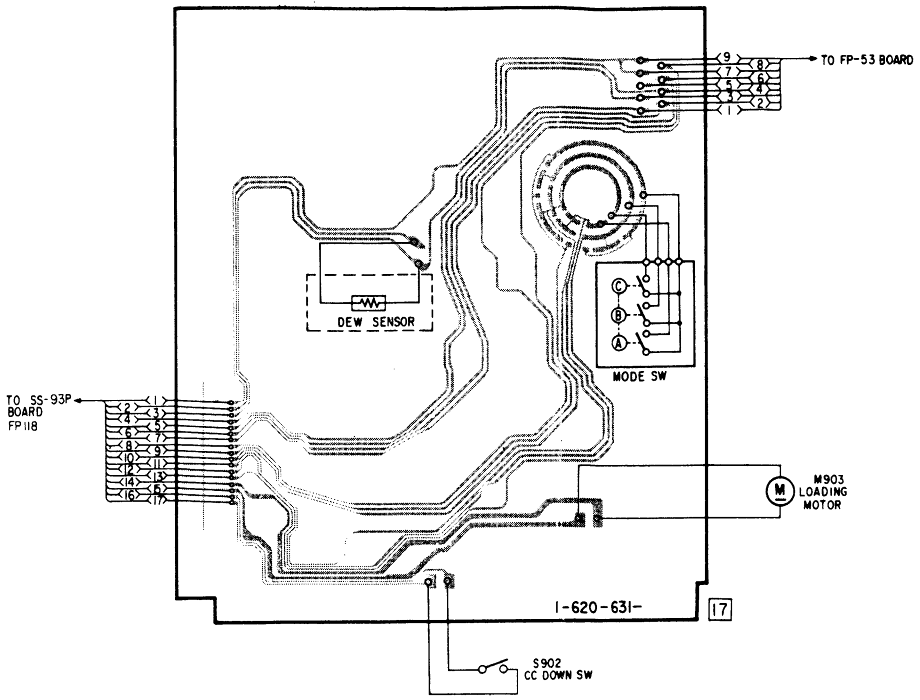
D001	D-4
D003	E-15
D004	E-15
D050	I-15
D051	H-15
D200	I-6
D201	G-5
D203	G-11
D399	F-14
IC001	D-2
IC002	B-15
IC003	F-4
IC004	F-5
IC005	B-3
IC006	E-7
IC007	F-7
IC200	H-10
IC201	H-12
IC202	H-4
IC203	I-7
IC301	C-6
Q001	B-3
Q002	B-14
Q005	B-13
Q006	G-14
Q007	E-10
Q008	G-14
Q051	I-15
Q052	H-15
Q053	G-2
Q054	E-6
Q055	F-2
Q070	F-3
Q071	F-15
Q073	F-15
Q074	F-15
Q075	C-15
Q076	F-14
Q078	F-14
Q079	F-15
Q080	F-14
Q081	F-2
Q090	F-2
Q201	I-7
Q202	I-7
Q203	I-5
Q204	H-7
Q205	H-7
Q206	G-11
Q302	C-4
Q303	C-13
Q304	B-11
Q305	B-5
Q307	C-11
Q308	A-10
Q309	A-6
Q310	A-11
Q311	A-12
Q312	A-12
Q313	B-12
Q314	B-12
Q315	B-12
Q316	A-12
Q317	C-11
Q318	C-11
Q319	D-14
Q320	B-4
Q321	F-15


SS-93P BOARD(COMPONENT SIDE)
SS-93P BOARD
(CONDUCTOR SIDE)
A
B
C
D
E
F
G
H
I
J
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
①
②
③
④
⑤
⑥
⑦
⑧
⑨
㊸
㊸
㊹
㊺
IC301
IC200
IC201
IC203
D200
1-631-592
1-631-592
11
11

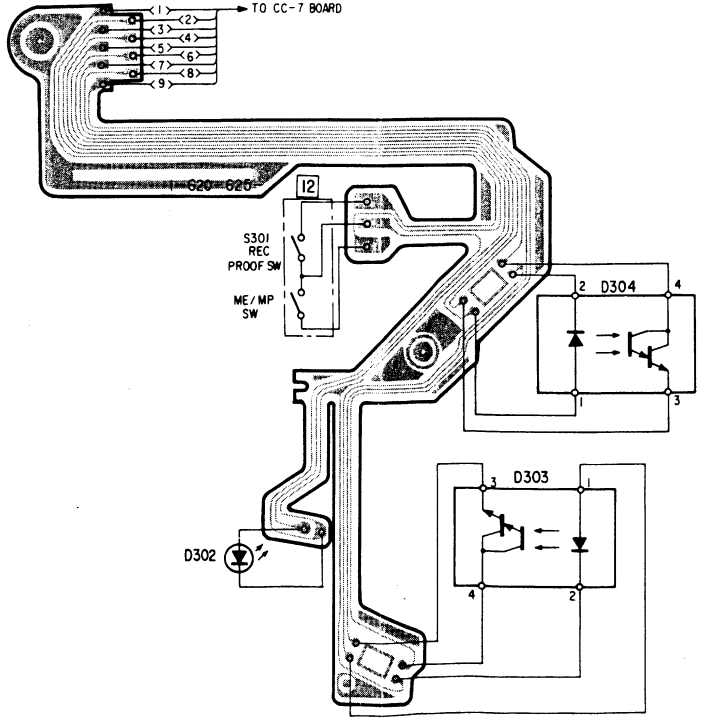
TO
BOA
FP11


Q316
Q312
R013
R012
Q005
CN004
R001
Q002
R003
R085
Q075
RV003
R334
Q319
R311
Q321
R117
D003
Q078
Q076
Q080
D004
Q079
R111
Q077
D399
Q008
IC201
R209
R208
R207
D060
D171
CN005
1-631-592-
11
12
13
14
15
16

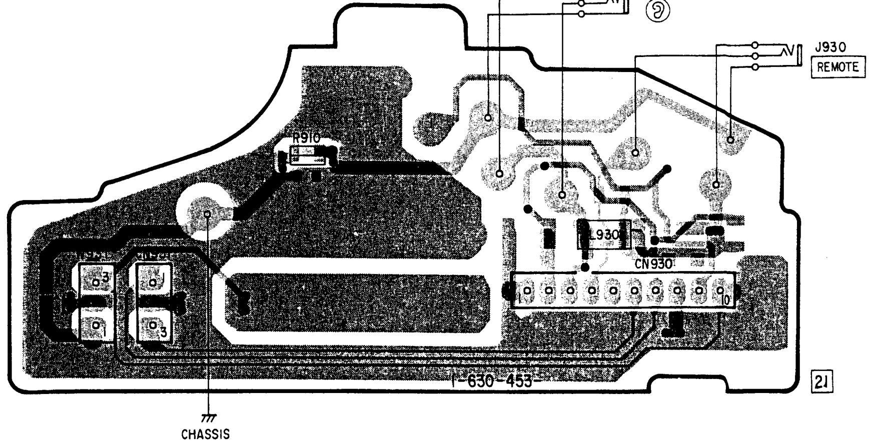
CC-7 BOARD


TO FP-53 BOARD
TO SS-93P BOARD FP118
DEW SENSOR
MODE SW
C
B
A
M903 LOADING MOTOR
M
1-620-631-
17
S902 CC DOWN SW

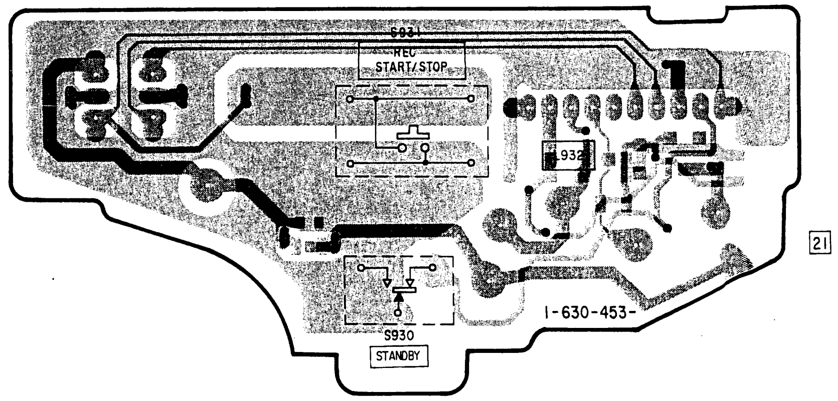
FP-53 BOARD (FLEXIBLE)


TO CC-7 BOARD
1-620-625-
12
S301 REC PROOF SW
ME/MP SW
D304
D303
D302

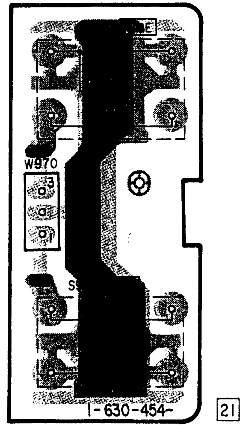
SW-111P BOARD (COMPONENT SIDE)

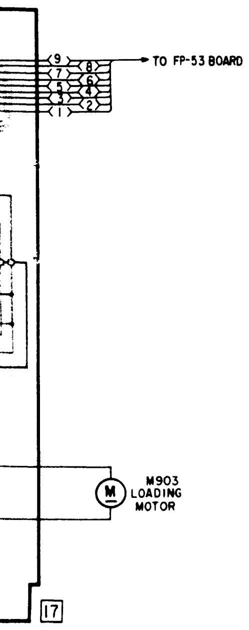

J931
J930
REMOTE
R910
L930
CN930
1-630-453-
21
CHASSIS

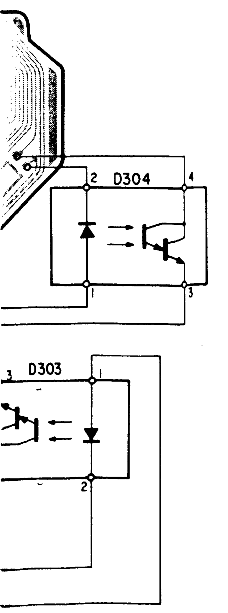
SW-111P BOARD (CONDUCTOR SIDE)


S931
REC START/STOP
L932
S930
STANDBY
1-630-453-
21

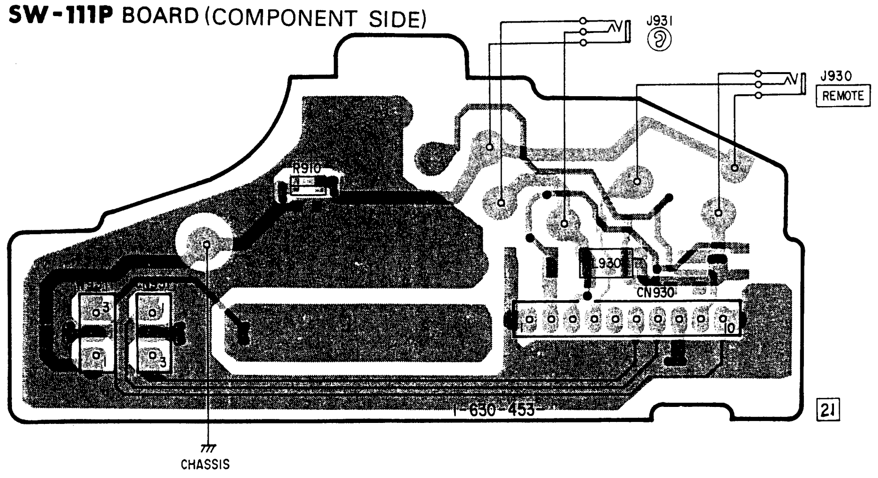
ZM-10P BOARD


W970
1-630-454-
21

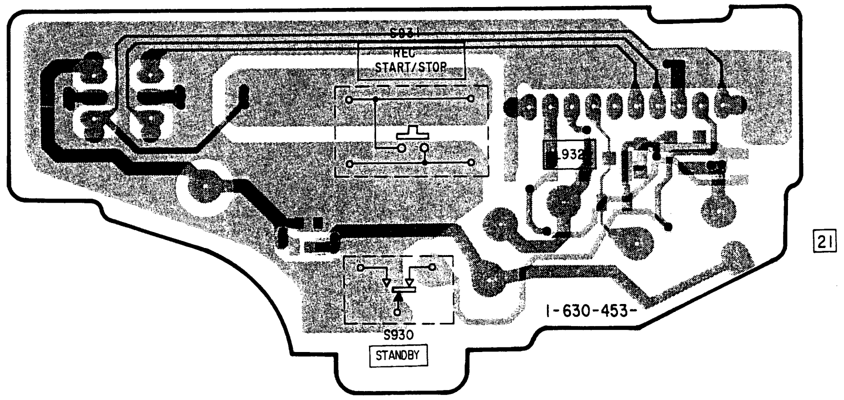

TO FP-53 BOARD
M903
LOADING
MOTOR
17



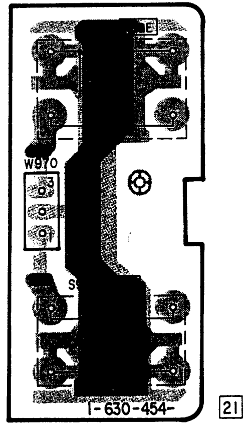
SW-111P BOARD (COMPONENT SIDE)


J931
J930
REMOTE
R910
L930
CN930
10
1-630-453-
CHASSIS
21

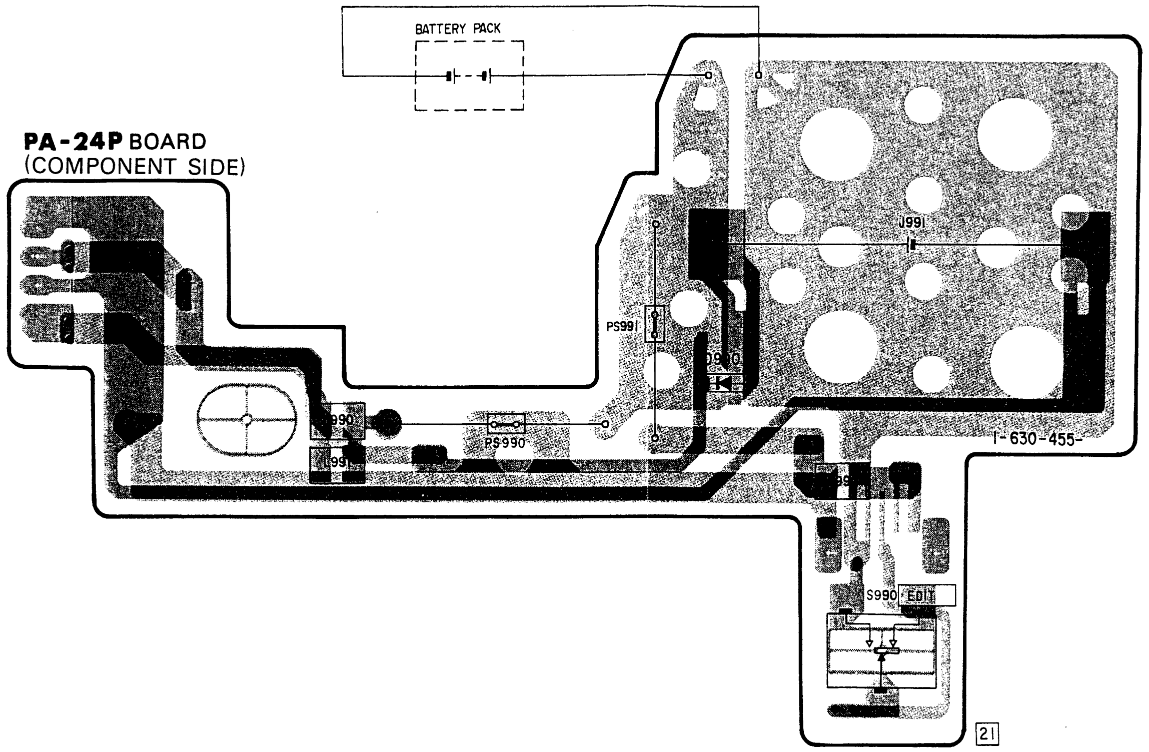
SW-111P BOARD (CONDUCTOR SIDE)


S93
REC
START/STOP
L932
S930
STANDBY
1-630-453-
21

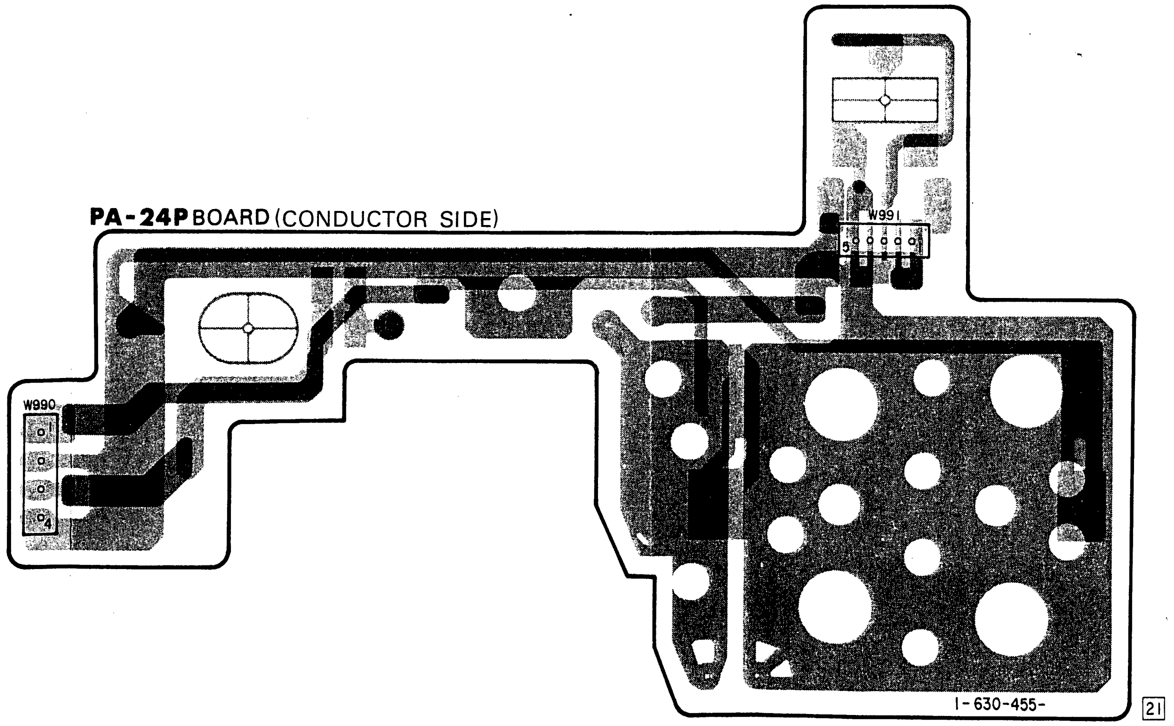
ZM-10P BOARD


W970
1-630-454-
21

PA-24P BOARD
(COMPONENT SIDE)


BATTERY PACK
J991
PS991
D990
W990
W991
PS990
S990
EDIT
1-630-455-
21

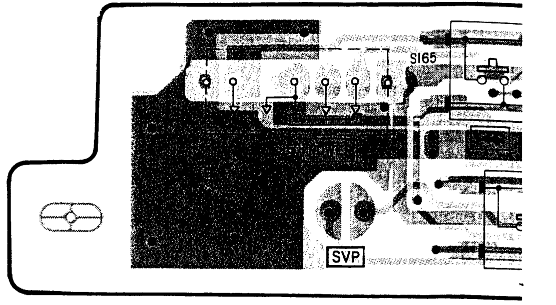
PA-24P BOARD (CONDUCTOR SIDE)


W991
W990
1-630-455-
21

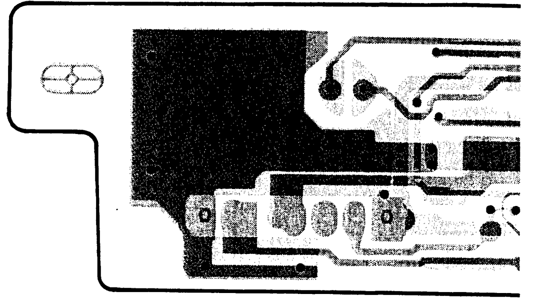
FC-25P (MODE CONTROL), FV-4P (POWER

—Ref. No. FC-25P, FV-4P, FD-12P, EJ-9P BOA

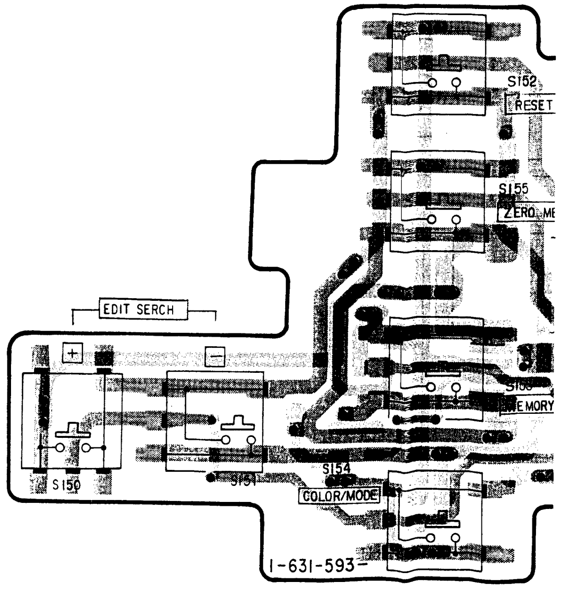
FV-4P BOARD (COMPONENT SIDE)



FV-4P BOARD (CONDUCTOR SIDE)



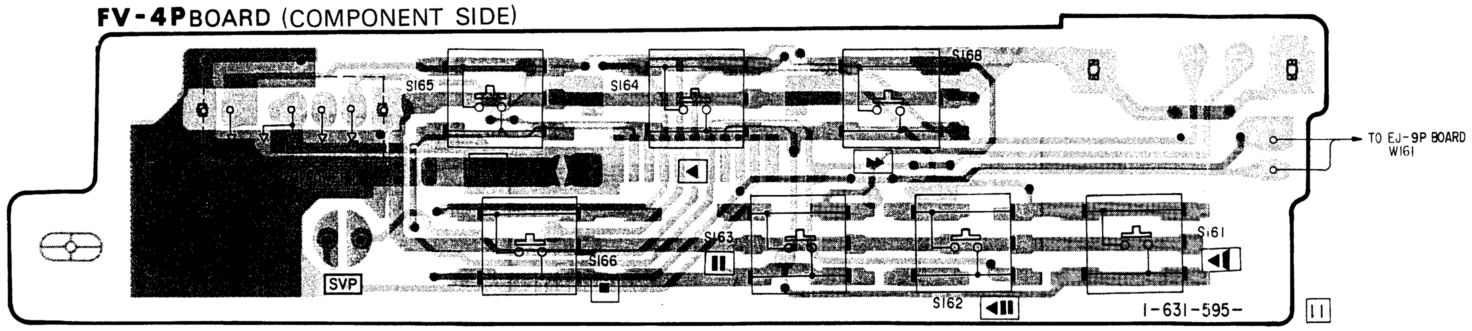
FD-12P BOARD(CC


S152
RESET
S155
ZERO ME
EDIT SERCH
+
−
S150
S151
S154
COLOR/MODE
EMORY
1-631-593

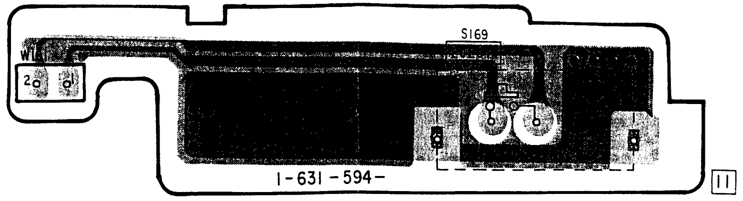
FC-25P (MODE CONTROL), FV-4P (POWER SWITCH, VTR FUNCTION SWITCH), FD-12P (CAMERA DATA FUNCTION SWITCH), EJ-9P (EJECT SWITCH) PRINTED WIRING BOARDS

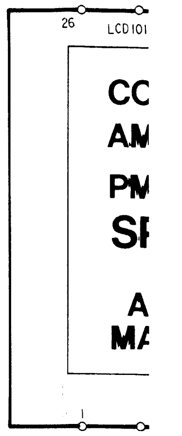
—Ref. No. FC-25P, FV-4P, FD-12P, EJ-9P BOARDS ; 4,000 series—

FV-4P BOARD (COMPONENT SIDE)

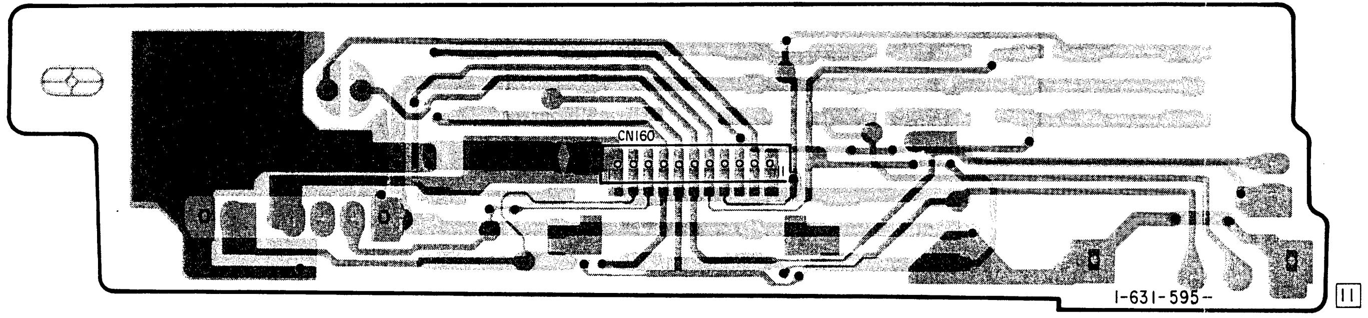

S165
S164
S168
TO EJ-9P BOARD W161
S166
S163
SVP
S162
S161
1-631-595-
11

EJ-9P BOARD (COMPONENT SIDE)

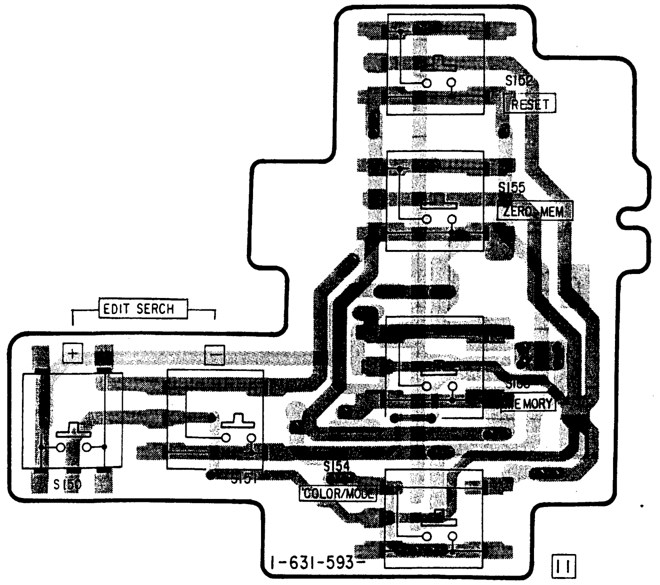

W161
2
S169
1-631-594-
11



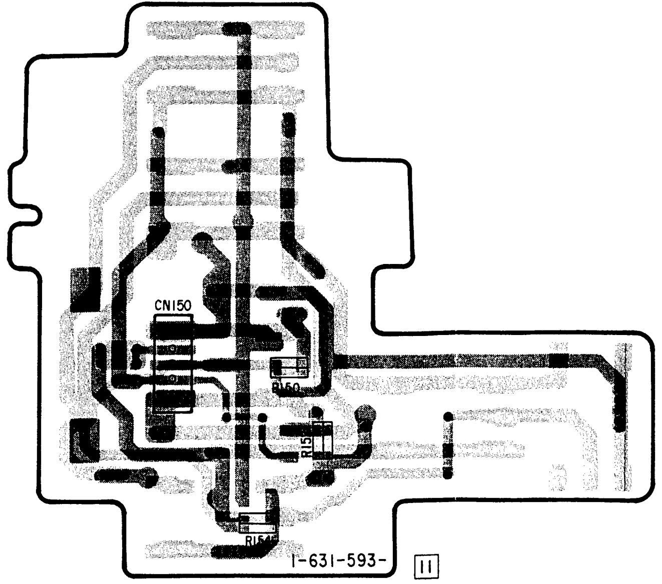
FV-4P BOARD (CONDUCTOR SIDE)


CN160
1-631-595-
11

FD-12P BOARD (COMPONENT SIDE)

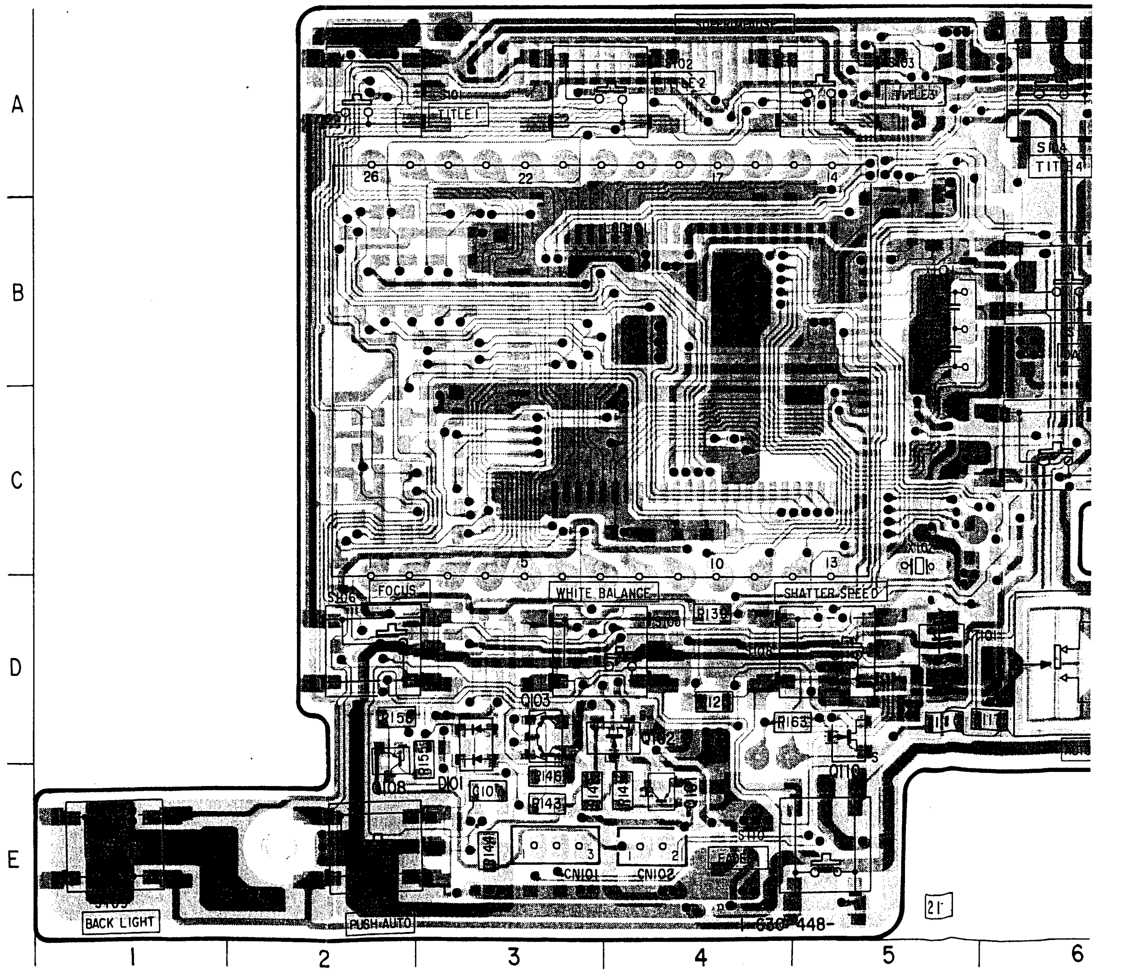

S152
RESET
S155
ZERO MEM
EDIT SERCH
+
−
MEMORY
S154
COLOR/MODE
S150
S151
1-631-593-
11

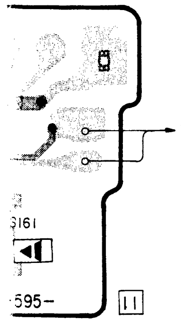
FD-12P BOARD (CONDUCTOR SIDE)


CN150
R150
R154
1-631-593-
11

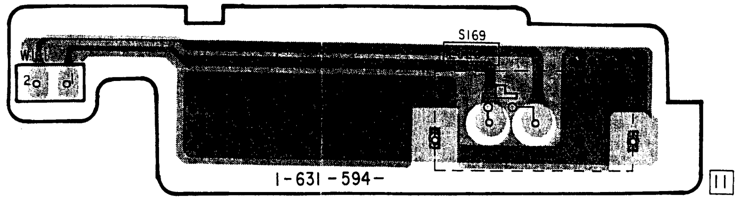
D101	D-3
D103	C-8
IC101	B-10
IC102	E-10
Q101	E-4
Q102	D-4
Q103	D-3
Q104	D-10
Q105	D-11
Q106	D-11
Q107	E-10
Q108	D-2
Q109	D-11
Q110	D-5

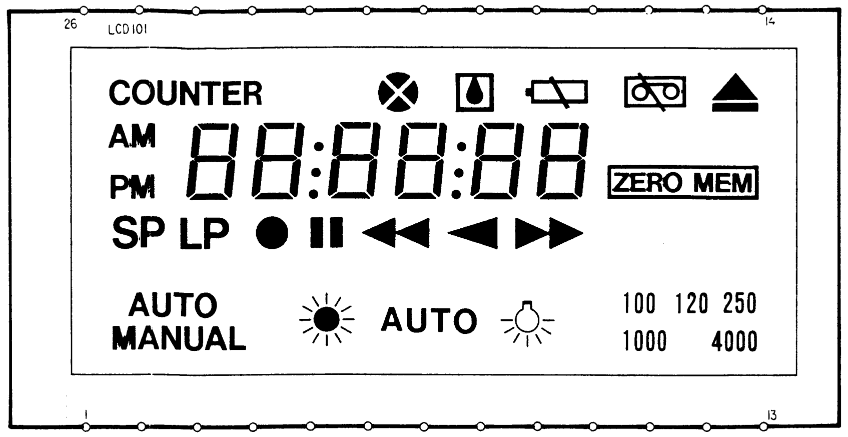
FC-25P BOARD (COMPONENT SIDE)

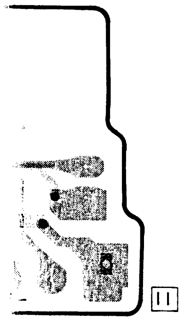

A
B
C
D
E
1
2
3
4
5
6
S101
TITLE 1
S102
TITLE 2
S103
TITLE 3
S104
TITLE 4
26
22
17
14
5
10
13
X102
S106
FOCUS
WHITE BALANCE
SHATTER SPEED
R139
Q103
Q102
R150
R153
D101
Q108
Q101
R146
R143
R163
Q110
CN101
CN102
S110
FADER
BACK LIGHT
PUSH AUTO
21
1-630-448-


TO EJ-9P BOARD
W161
S161
595-
11

EJ-9P BOARD (COMPONENT SIDE)

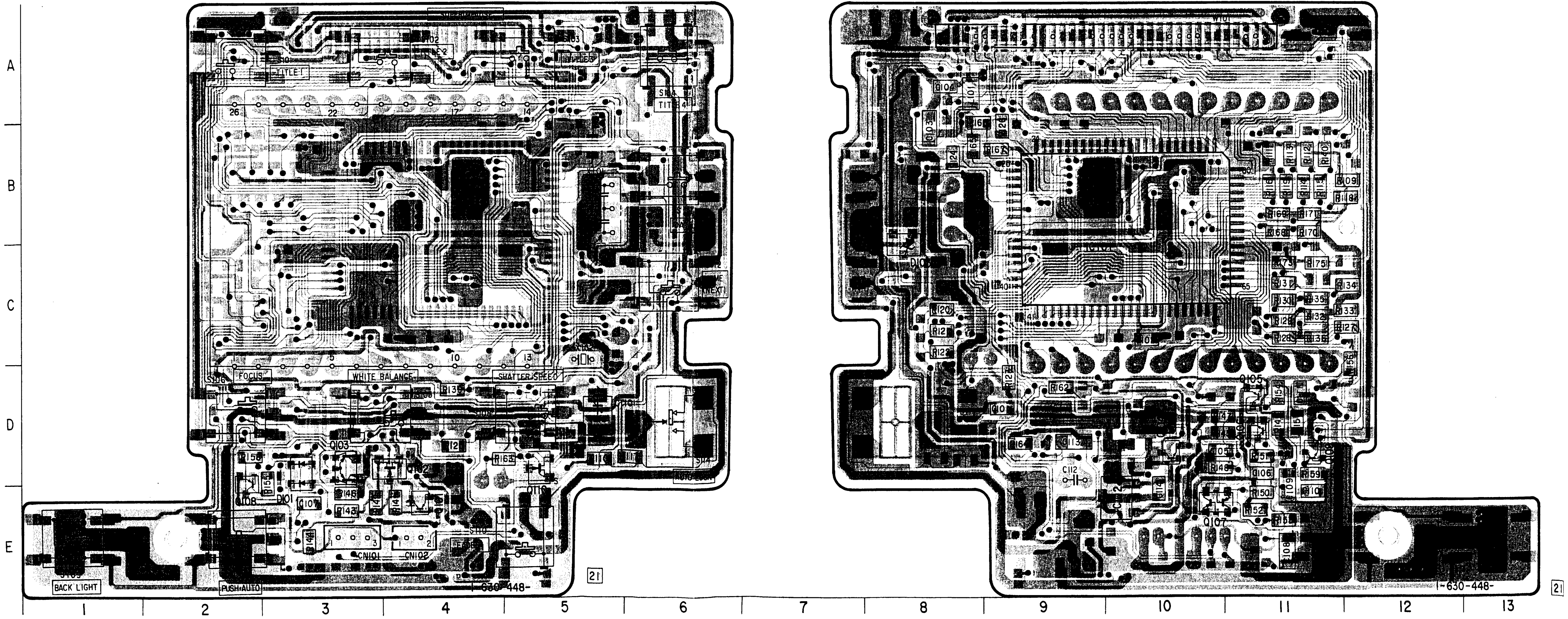

S169
2
1
1-631-594-
11


26
LCD101
14
COUNTER
AM
PM
88:88:88
ZERO MEM
SP LP
AUTO
MANUAL
AUTO
100 120 250
1000 4000
1
13

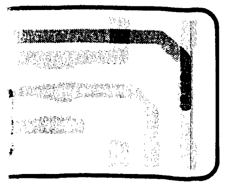


FC-25P BOARD(COMPONENT SIDE)

FC-25P BOARD(CONDUCTOR SIDE)

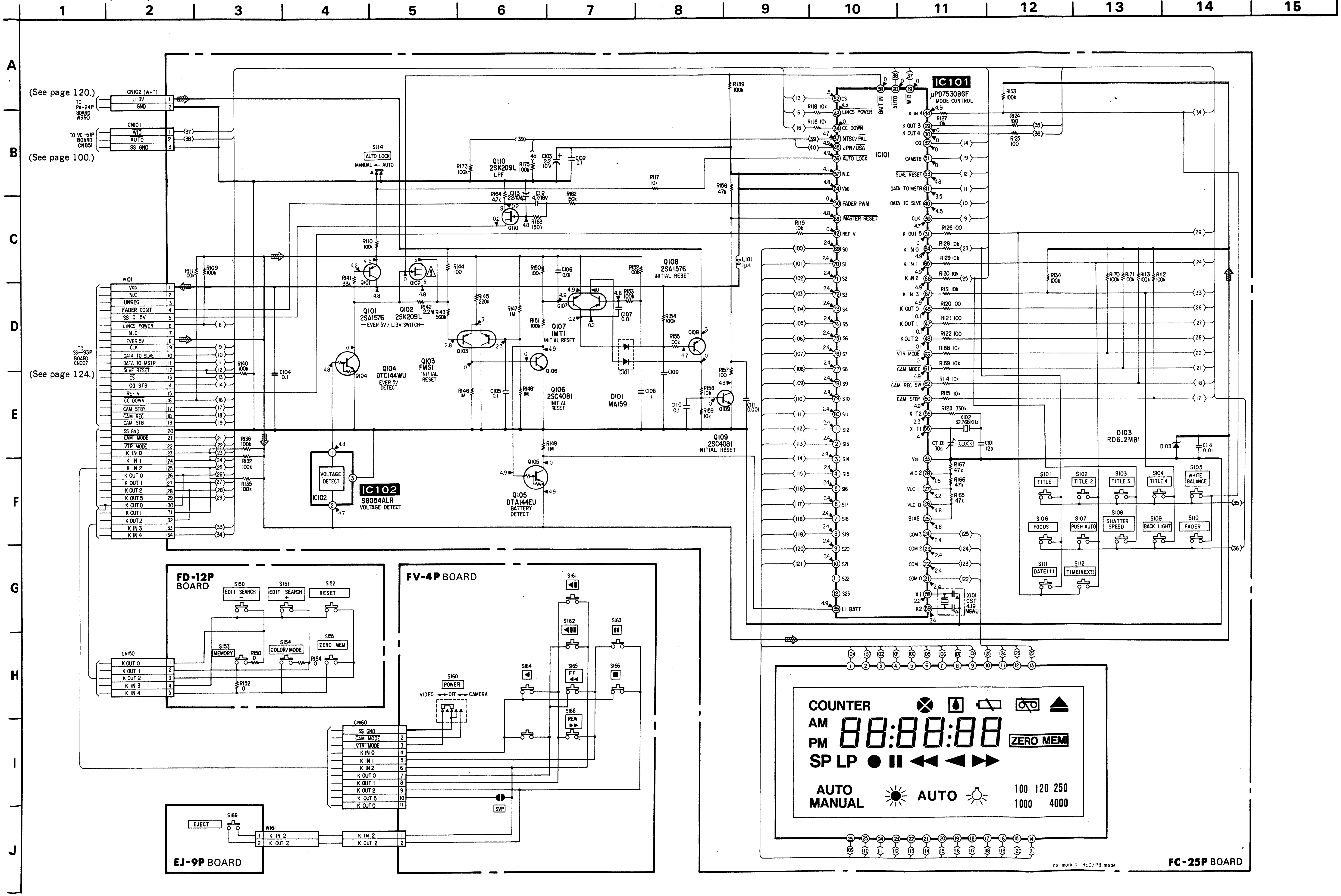

A
B
C
D
E
TITLE1
FOCUS
WHITE BALANCE
SHATTER SPEED
BACK LIGHT
PUSH AUTO
CN101
CN102
1-630-448-
21
1
2
3
4
5
6
7
8
9
10
11
12
13

D101	D-3
D103	C-8
IC101	B-10
IC102	E-10
Q101	E-4
Q102	D-4
Q103	D-3
Q104	D-10
Q105	D-11
Q106	D-11
Q107	E-10
Q108	D-2
Q109	D-11
Q110	D-5



FC-25P (MODE CONTROL), FV-4P (POWER SWITCH, VTR FUNCTION SWITCH), FD-12P (CAMERA DATA FUNCTION SWITCH), EJ-9P (EJECT SWITCH) SCHEMATIC DIAGRAM

—Ref. No. FC-25P, FV-4P, FD-12P, EJ-9P BOARDS ; 4,000 series—

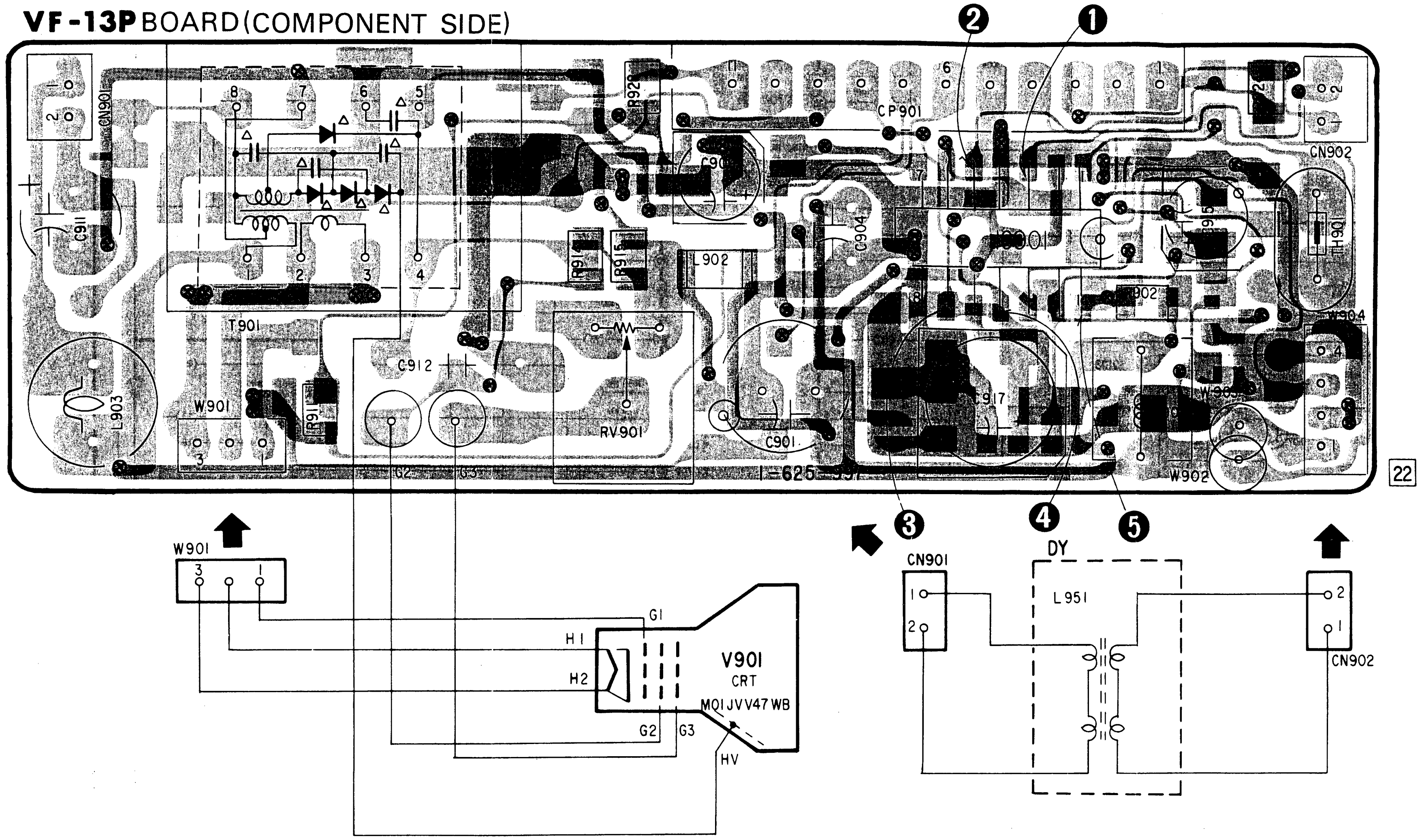

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
A B C D E F G H I J
(See page 120.)
TO PA-24P BOARD W990
CN102 (WHT)
LI 3V
GND
CN101
WID
AUTO
SS GND
TO VC-61P BOARD CN851
(See page 100.)
TO SS-93P BOARD CN007
(See page 124.)
W101
VDD
N.C
UNREG
FADER CONT
SS C 5V
LINCS POWER
N.C
EVER 5V
CLK
DATA TO SLVE
DATA TO MSTR
SLVE RESET
CS
CG STB
REF V
CC DOWN
CAM STBY
CAM REC
CAM STB
SS GND
CAM MODE
VTR MODE
K IN 0
K IN 1
K IN 2
K OUT 0
K OUT 1
K OUT 2
K OUT 5
K OUT 0
K OUT 1
K OUT 2
K IN 3
K IN 4
S114
AUTO LOCK
MANUAL ← AUTO
Q110
2SK209L
LPF
Q101
2SA1576
Q102
2SK209L
— EVER 5V / LI3V SWITCH—
Q103
FMS1
INITIAL RESET
Q104
DTC144WU
EVER 5V DETECT
Q105
DTA144EU
BATTERY DETECT
Q106
2SC4081
INITIAL RESET
Q107
IMT1
INITIAL RESET
Q108
2SA1576
INITIAL RESET
Q109
2SC4081
INITIAL RESET
D101
MA159
IC102
S8054ALR
VOLTAGE DETECT
IC101
μPD75308GF
MODE CONTROL
LINCS POWER
CC DOWN
NTSC/PAL
JPN/USA
AUTO LOCK
N.C
VDD
FADER PWM
MASTER RESET
REF V
LI BATT
BATT IN
AUTO
WID
K IN 4
K OUT 3
K OUT 4
CG
CAMSTB
SLVE RESET
DATA TO MSTR
DATA TO SLVE
CLK
K OUT 5
K IN 0
K IN 1
K IN 2
K IN 3
K OUT 0
K OUT 1
K OUT 2
VTR MODE
CAM MODE
CAM REC SW
CAM STBY
X T2
X T1
Vss
VLC 2
VLC 1
VLC 0
BIAS
COM 3
COM 2
COM 1
COM 0
X1
X2
X102 32.768KHz
CLOCK
X101 CST 4.19 MGWU
D103
RD6.2MB1
S101 TITLE 1
S102 TITLE 2
S103 TITLE 3
S104 TITLE 4
S105 WHITE BALANCE
S106 FOCUS
S107 PUSH AUTO
S108 SHATTER SPEED
S109 BACK LIGHT
S110 FADER
S111 DATE(+1)
S112 TIME(NEXT)
FD-12P BOARD
S150 EDIT SEARCH −
S151 EDIT SEARCH +
S152 RESET
S153 MEMORY
S154 COLOR/MODE
S155 ZERO MEM
CN150
K OUT 0
K OUT 1
K OUT 2
K IN 3
K IN 4
FV-4P BOARD
S160 POWER
VIDEO ← OFF → CAMERA
S161
S162
S163
S164
S165 FF
S166
S168 REW
CN160
SS GND
CAM MODE
VTR MODE
K IN 0
K IN 1
K IN 2
K OUT 0
K OUT 1
K OUT 2
K OUT 5
K OUT 0
SVP
EJ-9P BOARD
EJECT
S169
W161
K IN 2
K OUT 2
COUNTER
AM
PM
88:88:88
ZERO MEM
SP LP
AUTO
MANUAL
AUTO
100 120 250
1000 4000
no mark : REC/PB mode
FC-25P BOARD

VF-13P (VIEWFINDER), TL-18P (LED), TL-19P (LED) PRINTED WIRING BOARDS

—Ref. No. VF-13P, TL-18P, TL-19P BOARDS ; 5,000 series—

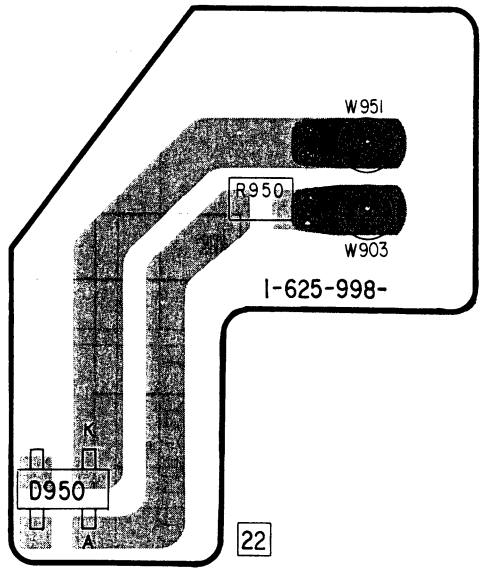
- ⊗ : Through hole.

VF-13P BOARD(COMPONENT SIDE)



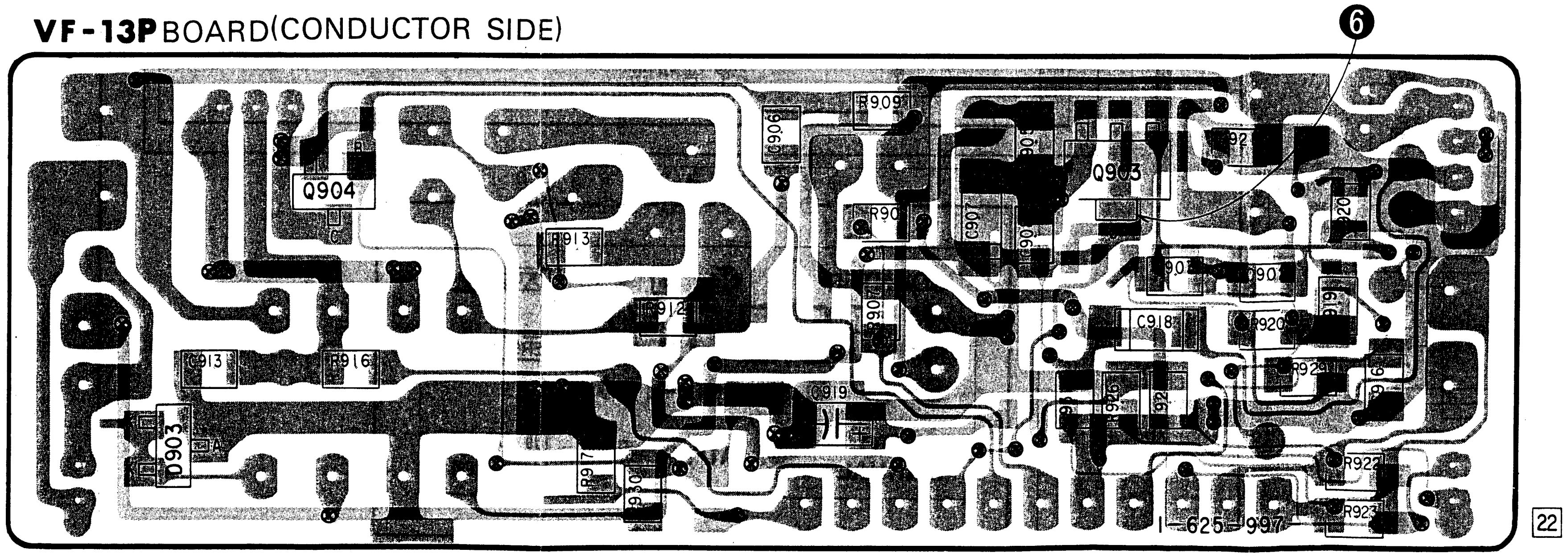
❷
❶
CN901
8
7
6
5
4
3
2
T901
CP901
C909
C904
R929
R914
R915
L902
C912
RV901
C901
C917
CN902
TH901
W904
W903
W902
W901
L903
C911
G2
G3
1-625-997
22
W901
❸
❹
❺
CN901
DY
L951
CN902
G1
H1
H2
V901
CRT
M01JVV47WB
G2
G3
HV

TL-18 P BOARD(COMPONENT SIDE)



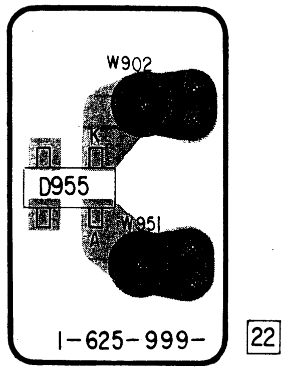
W951
R950
W903
1-625-998-
K
D950
A
22

VF-13P BOARD(CONDUCTOR SIDE)



❻
Q904
R909
C906
Q903
R913
R912
Q913
R916
D903
C918
R920
C919
R917
R922
R923
1-625-997
22

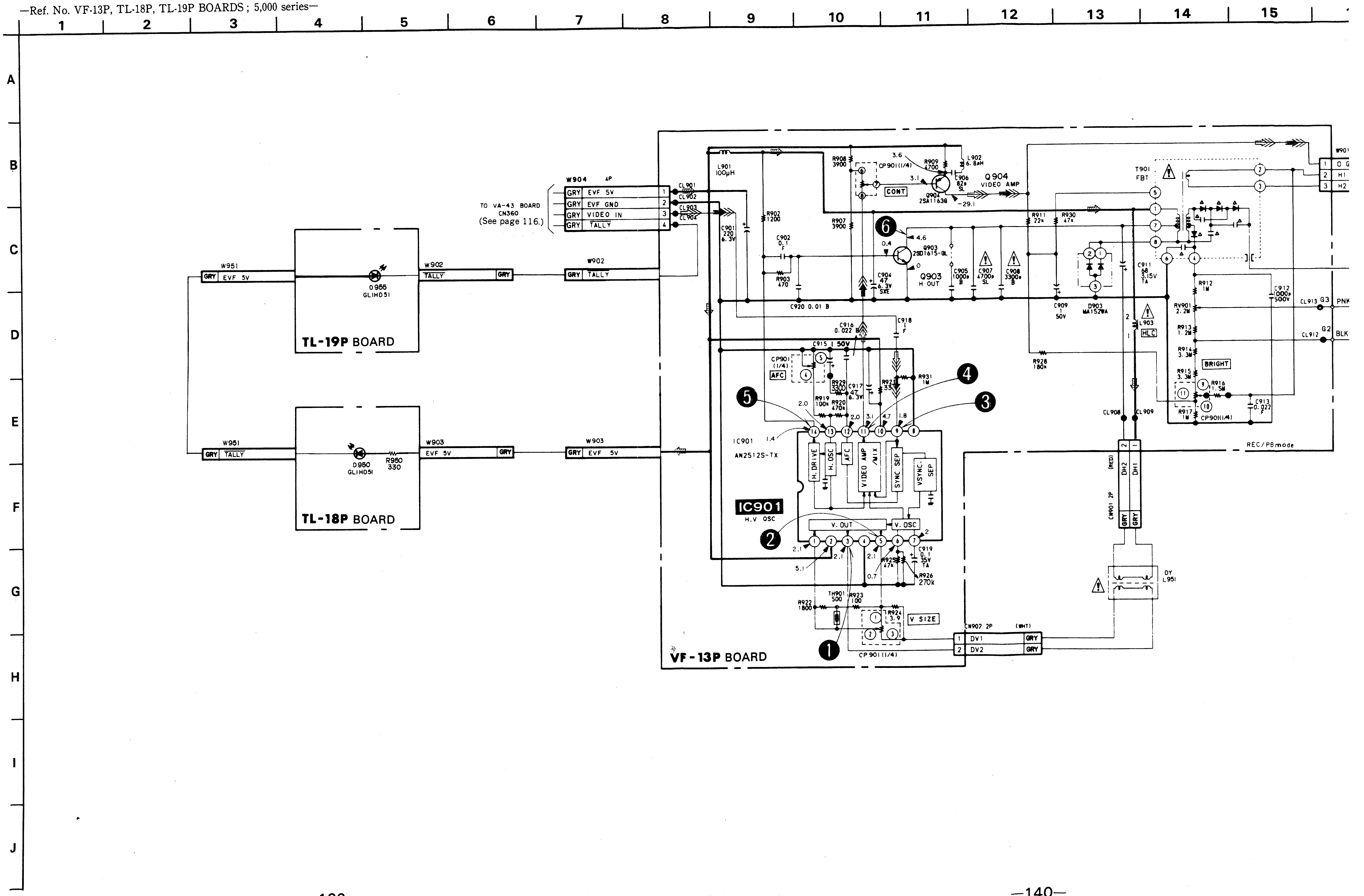
TL- 19P BOARD(COMPONENT SIDE)

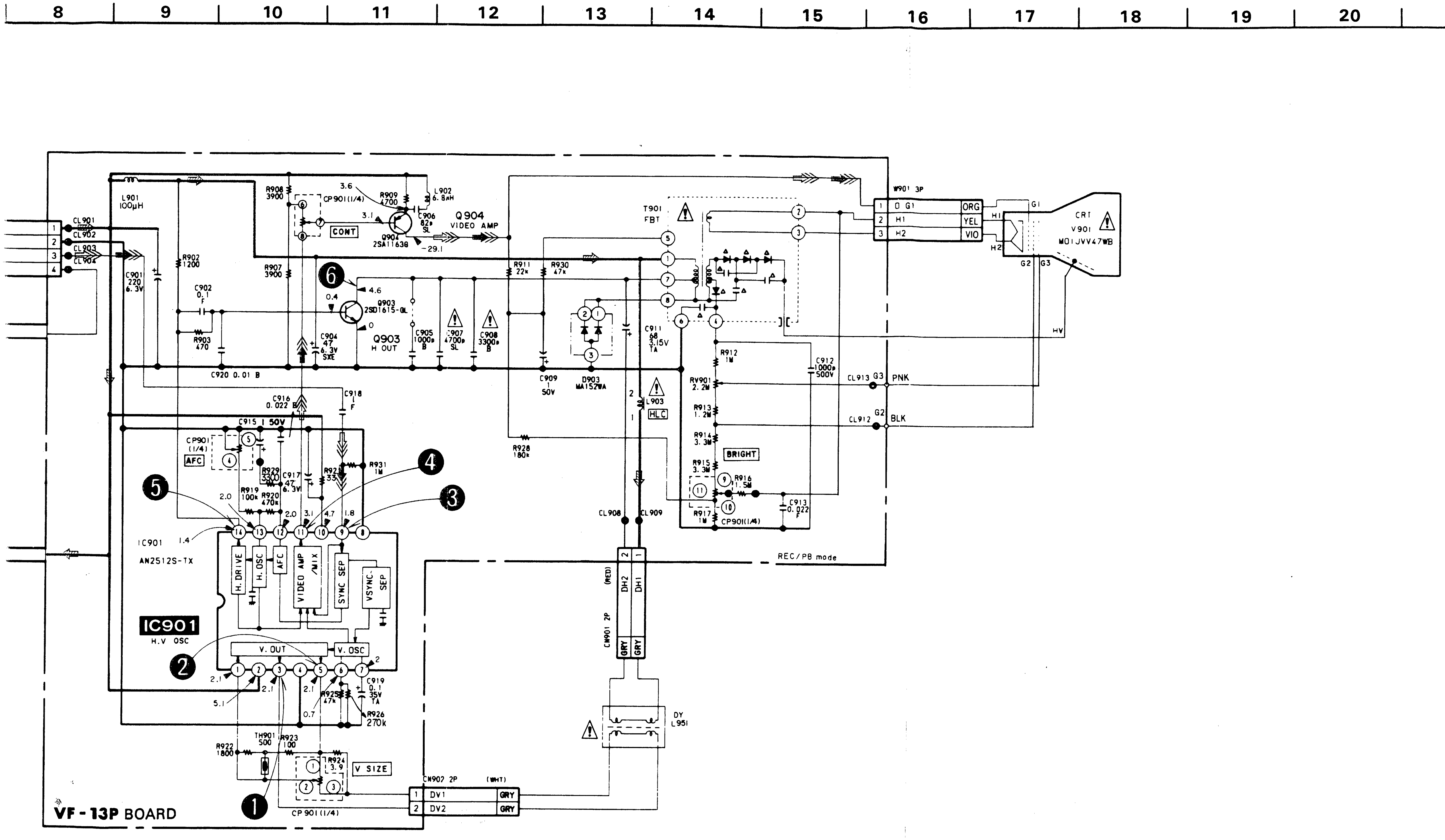


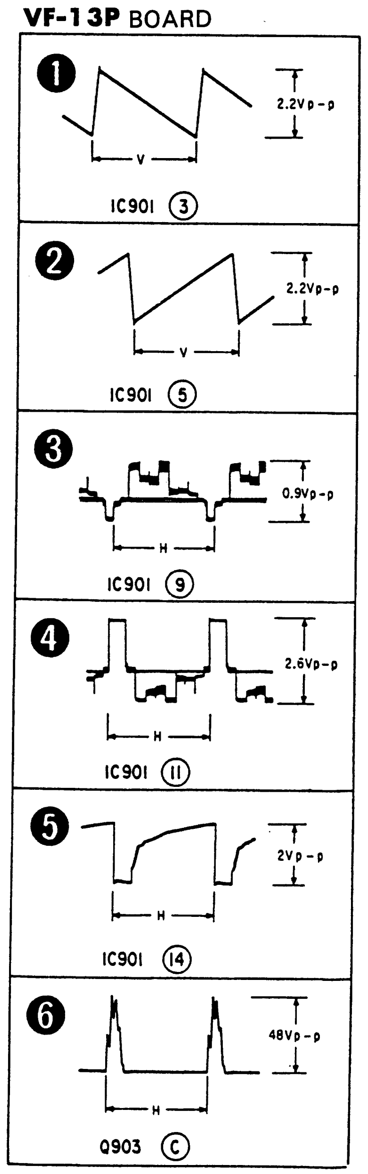
W902
K
D955
W951
A
1-625-999-
22

VF-13P (VIEWFINDER), TL-18P (LED), TL-19P (LED) SCHEMATIC DIAGRAM

—Ref. No. VF-13P, TL-18P, TL-19P BOARDS ; 5,000 series—


1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
A
B
C
D
E
F
G
H
I
J
TL-19P BOARD
TL-18P BOARD
VF-13P BOARD
W951
GRY EVF 5V
GRY TALLY
W902
TALLY
W903
EVF 5V
D955
GL1HD51
D950
GL1HD51
R950
330
W904 4P
GRY EVF 5V
GRY EVF GND
GRY VIDEO IN
GRY TALLY
TO VA-43 BOARD
CN360
(See page 116.)
CL901
CL902
CL903
CL904
L901
100μH
C901
220
6.3V
R902
1200
R908
3900
R907
3900
CP901(1/4)
CONT
R909
4700
L902
6.8μH
C906
82p
SL
Q904
2SA1163B
VIDEO AMP
Q903
2SD1615-GL
H OUT
R903
470
C902
0.1
F
C904
47
6.3V
SXE
C905
1000p
B
C907
4700p
SL
C908
3300p
B
C920 0.01 B
C916
0.022 B
C918
1
F
C915 1 50V
CP901
(1/4)
AFC
R929
3300
C917
47
6.3V
R927
33k
R931
1M
R919
100k
R920
470k
IC901
AN2512S-TX
IC901
H.V OSC
H. DRIVE
H. OSC
AFC
VIDEO AMP /MIX
SYNC SEP
VSYNC-SEP
V. OUT
V. OSC
C919
0.1
35V
TA
R925
47k
R926
270k
R922
1800
TH901
500
R923
100
R924
3.9
V SIZE
CP901(1/4)
CN902 2P
(WHT)
DV1
DV2
GRY
R911
22k
R930
47k
T901
FBT
C909
1
50V
D903
MA152WA
C911
68
3.15V
TA
L903
HLC
R928
180k
CL908
CL909
CN901 2P
(RED)
DH2
DH1
GRY
DY
L951
R912
1M
C912
1000p
500V
CL913
G3
PNK
CL912
G2
BLK
RV901
2.2M
R913
1.2M
R914
3.3M
R915
3.3M
BRIGHT
R916
1.5M
R917
1M
CP901(1/4)
C913
0.022
F
REC/PBmode
W901
0
H1
H2
3.6
3.1
-29.1
4.6
0.4
0
2.0
1.4
2.0
3.1
4.7
1.8
2.1
2.1
5.1
2.1
0.7
2
1
2
3
4
5
6

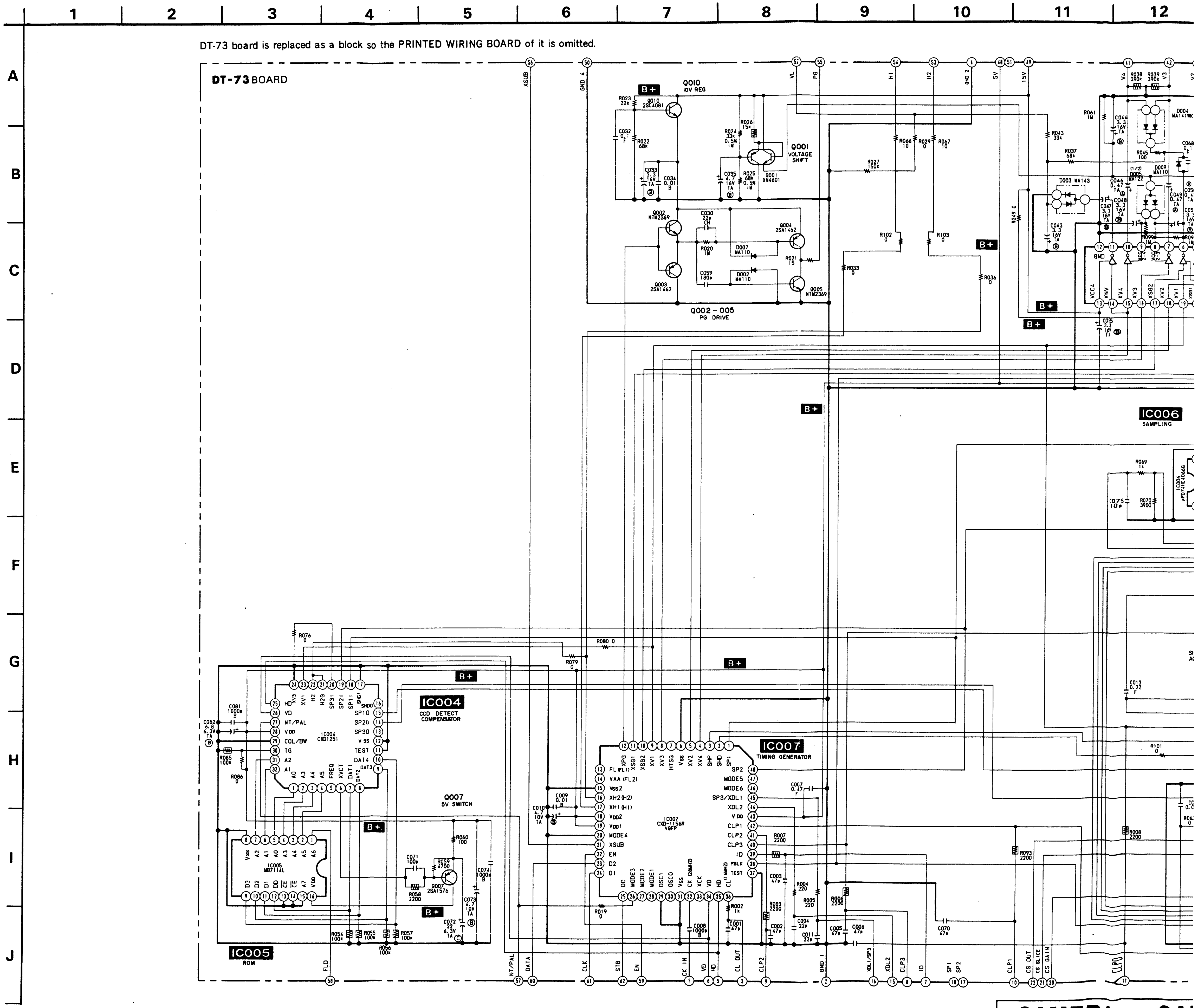

8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
A
B
C
D
E
F
G
H
I
J
VF-13P BOARD
CL901
CL902
CL903
CL904
L901 100μH
C901 220 6.3V
R902 1200
C902 0.1 F
R903 470
C920 0.01 B
R908 3900
R907 3900
CP901(1/4)
CONT
3.6
3.1
R909 4700
L902 6.8mH
C906 82p SL
Q904 2SA1163B
Q904 VIDEO AMP
-29.1
4.6
0.4
Q903 2SD1615-GL
0
Q903 H OUT
C904 47 6.3V SXE
C905 1000p B
C907 4700p SL
C908 3300p B
R911 22k
R930 47k
C909 1 50V
D903 MA152WA
T901 FBT
C911 68 3.15V TA
L903
HLC
R912 1M
RV901 2.2M
R913 1.2M
R914 3.3M
BRIGHT
R915 3.3M
R916 1.5M
R917 1M
CP901(1/4)
C912 1000p 500V
C913 0.022 F
CL913 G3 PNK
CL912 G2 BLK
W901 3P
G1 ORG
H1 YEL
H2 VIO
CRT V901 M01JVV47WB
G1
G2
G3
H1
H2
HV
R928 180k
CL908
CL909
REC/PB mode
CN901 2P (RED)
DH2
DH1
GRY
GRY
DY L951
C916 0.022 B
C915 1 50V
C918 1 F
CP901 (1/4)
AFC
R929 3300
R919 100k
R920 470k
C917 47 6.3V
R921 33
R931 1M
IC901
AN2512S-TX
IC901 H.V OSC
H. DRIVE
H. OSC
AFC
VIDEO AMP /MIX
SYNC SEP
VSYNC SEP
V. OUT
V. OSC
1.4
2.0
2.0
3.1
4.7
1.8
2.1
5.1
2.1
2.1
0.7
2
R925 47k
C919 0.1 35V TA
R926 270k
R922 1800
TH901 500
R923 100
R924 3.9
V SIZE
CP901(1/4)
CN902 2P (WHT)
DV1 GRY
DV2 GRY



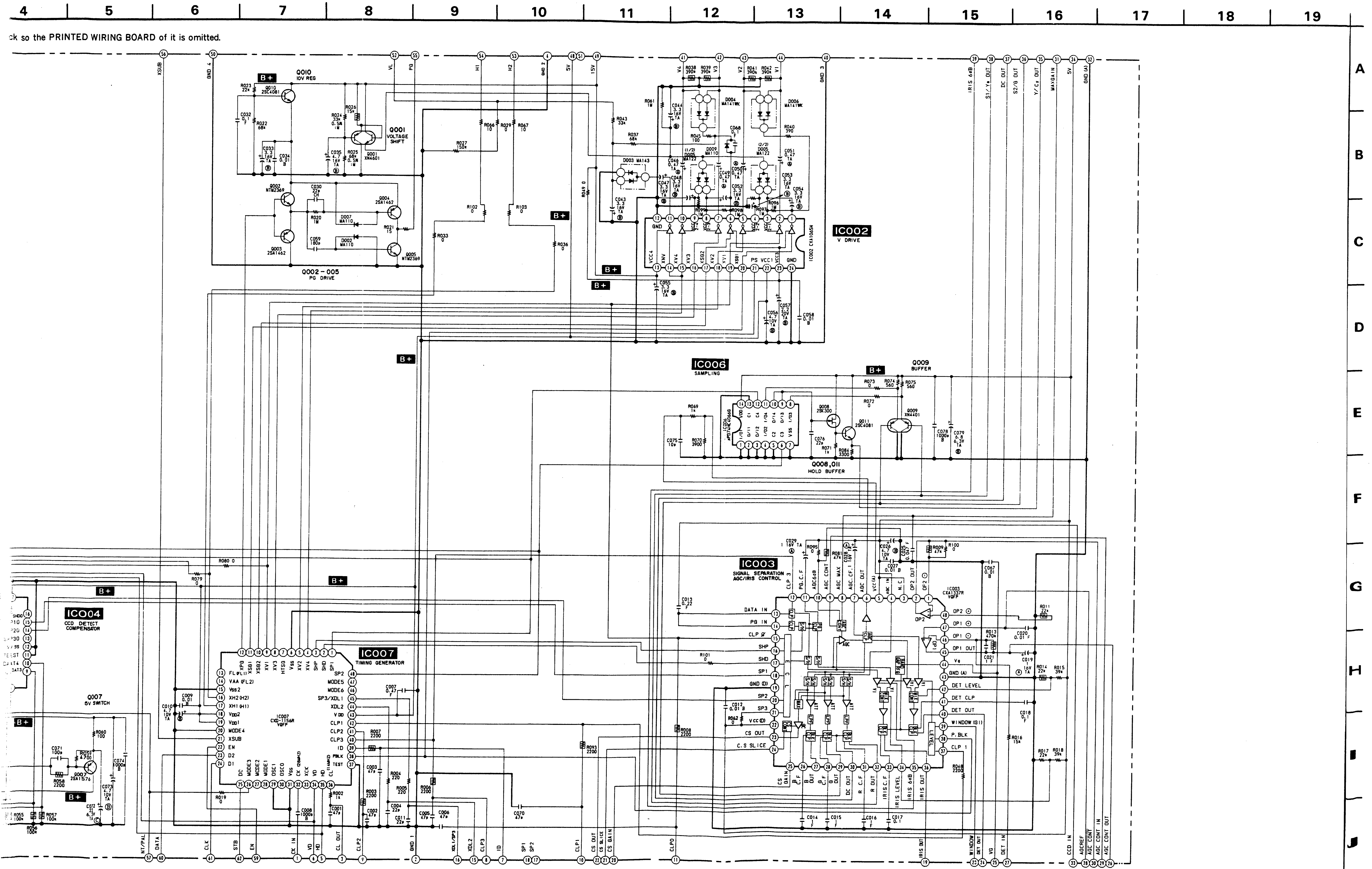
- **Signal path**
  ➡: REC Y/CHROMA Signal
  ⇨: PB Y/CHROMA Signal

DT-73 (CCD DRIVE/TIMING GENERATOR)

DT-73 board is replaced as a block so the PRINTED WIRING BOARD of it is omitted.


1
2
3
4
5
6
7
8
9
10
11
12
A
B
C
D
E
F
G
H
I
J
DT-73 BOARD
Q010
10V REG
Q010 2SC4081
Q001
VOLTAGE SHIFT
Q001 XN4601
Q002 NTM2369
Q003 2SA1462
Q004 2SA1462
Q005 NTM2369
Q002 - 005
PG DRIVE
D007 MA110
D002 MA110
D003 MA143
D004 MA141WK
IC006
SAMPLING
IC004
CCD DETECT COMPENSATOR
IC004 CXD1251
IC005
ROM
IC005 MB7114L
IC007
TIMING GENERATOR
IC007 CXD-1156R VQFP
Q007
5V SWITCH
Q007 2SA1576
B+
XSUB
GND 4
VL
PG
H1
H2
GND 2
5V
15V
FLD
NT/PAL
DATA
CLK
STB
EN
CK IN
VD
HD
CL OUT
CLP2
GND 1
XDL1/SP3
XDL2
CLP3
ID
SP1
SP2
CLP1
CS OUT
CS SLICE
CS GAIN

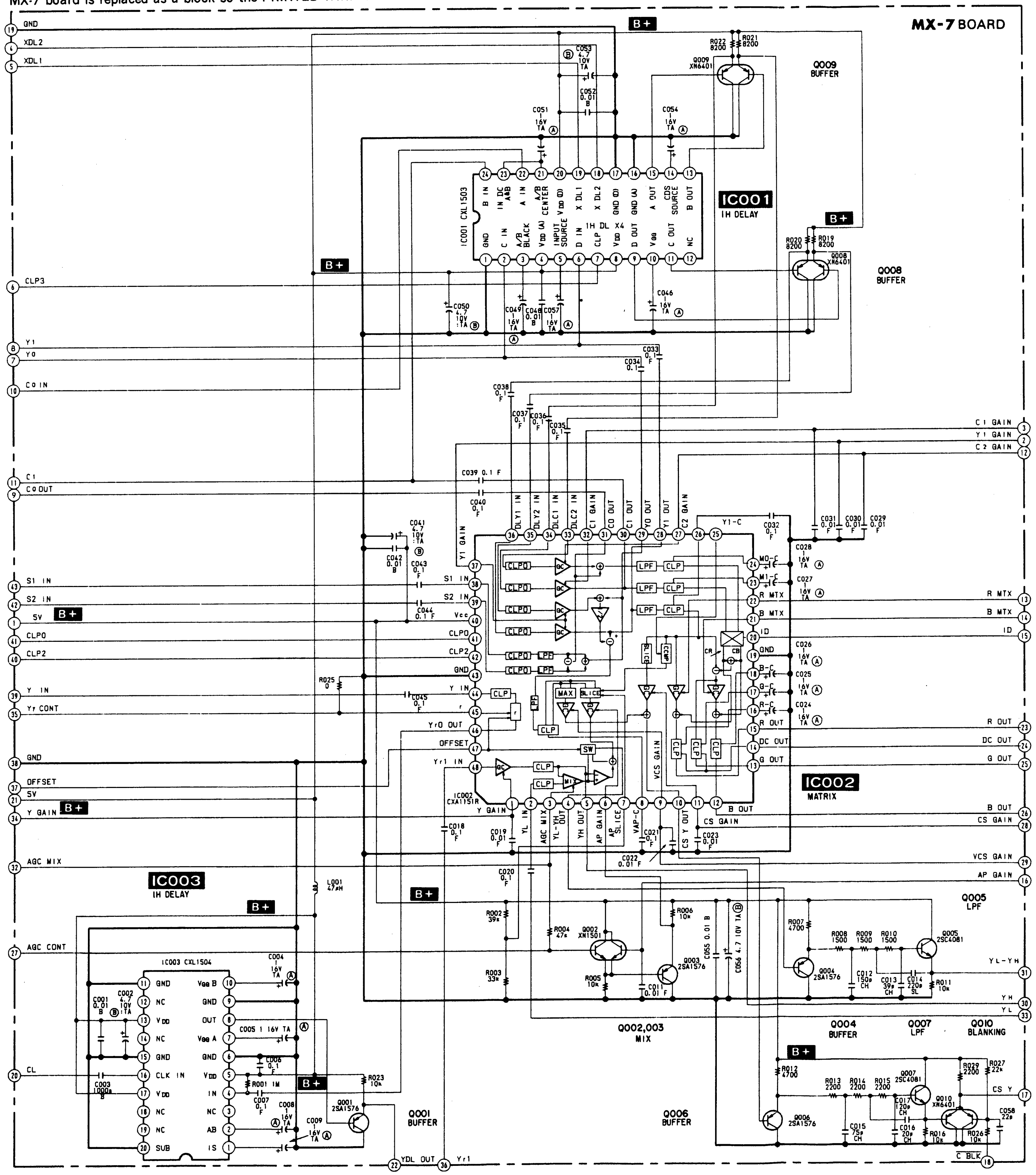
ck so the PRINTED WIRING BOARD of it is omitted.


4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
A
B
C
D
E
F
G
H
I
J
Q010
10V REG
Q001
VOLTAGE SHIFT
Q002-005
PG DRIVE
IC002
V DRIVE
IC002 CXA1065M
IC006
SAMPLING
Q009
BUFFER
Q008,011
HOLD BUFFER
IC003
SIGNAL SEPARATION AGC/IRIS CONTROL
IC003 CXA1337R VQFP
IC004
CCD DETECT COMPENSATOR
Q007
5V SWITCH
IC007
TIMING GENERATOR
IC007 CXD-1156R VQFP
B+
XSUB
GND 4
VL
PG
H1
H2
GND 2
5V
15V
V4
V3
V2
V1
GND 3
IRIS 6dB
S1/Y+ OUT
DC OUT
S2/B OUT
Y/C+ OUT
MAXGAIN
5V
GND (A)
NT/PAL
DATA
CLK
STB
EN
CK IN
VD
HD
CL OUT
CLP2
GND 1
XDL1/SP3
XDL2
CLP3
ID
SP1
SP2
CLP1
CS OUT
CS SLICE
CS GAIN
CLP0
IRIS OUT
WINDOW
DET OUT
VG
DET IN
CCD IN
AGCREF
AGC CONT
AGC CONT IN
AGC CONT OUT

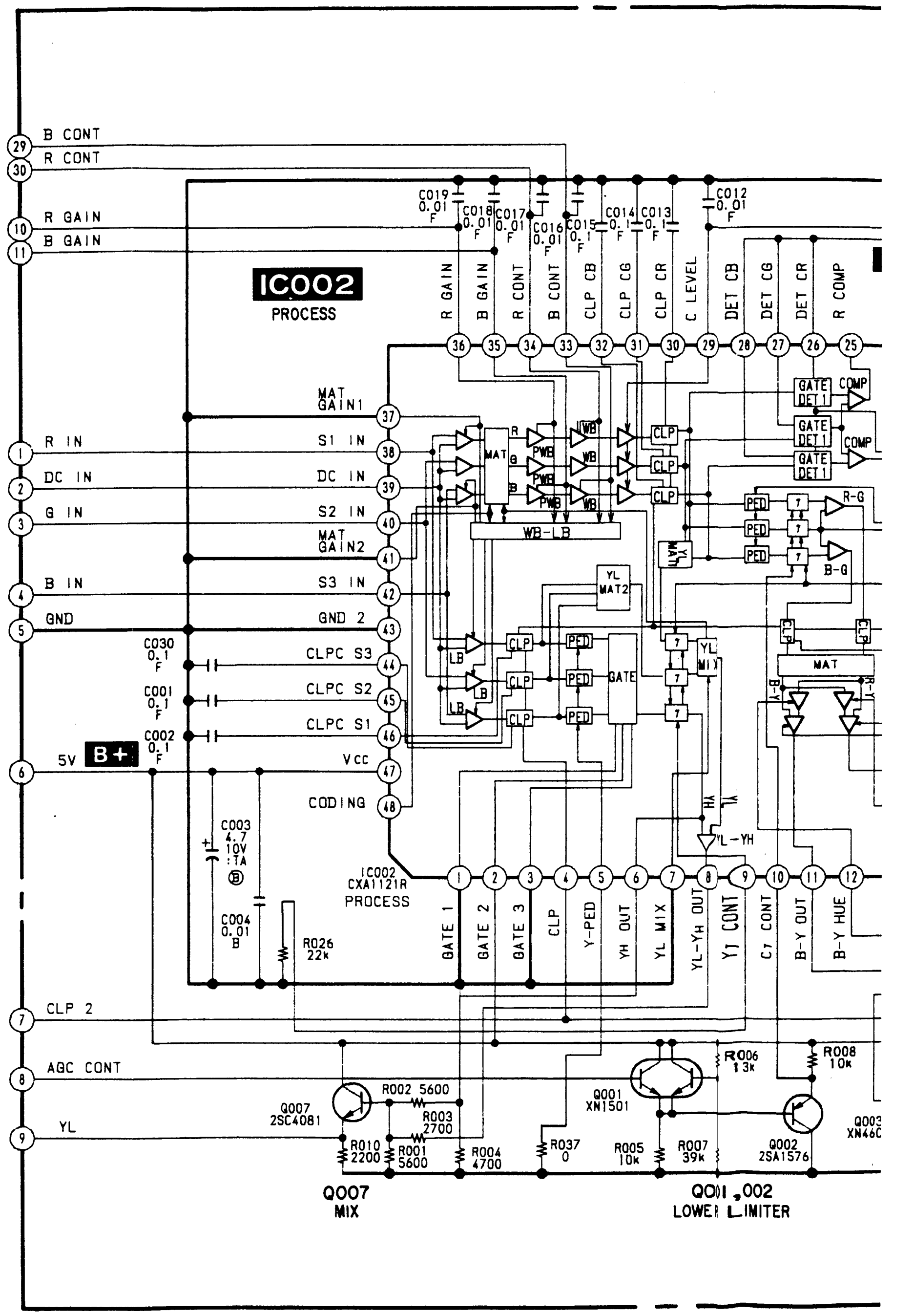
CAMERA CAMERA

MX-7 (CAMERA MATRIX), PR-20 (CAMERA PROCESS)

MX-7 board is replaced as a block so the PRINTED WIRING BOARD of it is omitted.

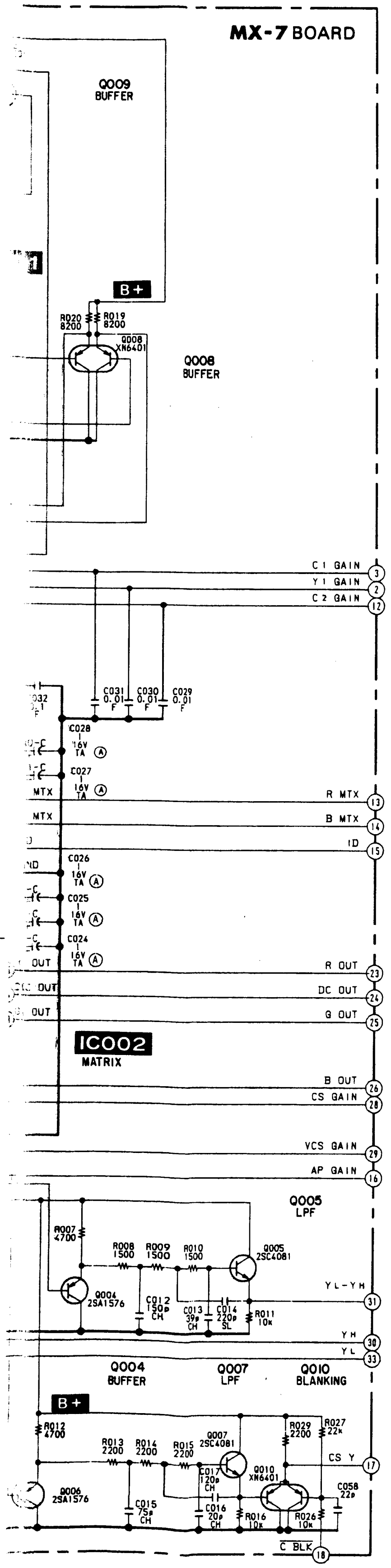

MX-7 BOARD
IC001 CXL1503
IC001 1H DELAY
IC002 CXA1151R
IC002 MATRIX
IC003 CXL1504
IC003 1H DELAY
Q001 BUFFER
Q002,003 MIX
Q004 BUFFER
Q005 LPF
Q006 BUFFER
Q007 LPF
Q008 BUFFER
Q009 BUFFER
Q010 BLANKING
B+
GND
XDL2
XDL1
CLP3
Y1
Y0
C0 IN
C1
C0 OUT
S1 IN
S2 IN
5V
CLP0
CLP2
Y IN
Yr CONT
OFFSET
Y GAIN
AGC MIX
AGC CONT
CL
C1 GAIN
Y1 GAIN
C2 GAIN
R MTX
B MTX
ID
R OUT
DC OUT
G OUT
B OUT
CS GAIN
VCS GAIN
AP GAIN
YL-YH
YH
YL
CS Y
C BLK
YDL OUT
Yr1

PR-20 board is replaced as a block so the PRINTED WIRING BOARD of it is omitted.

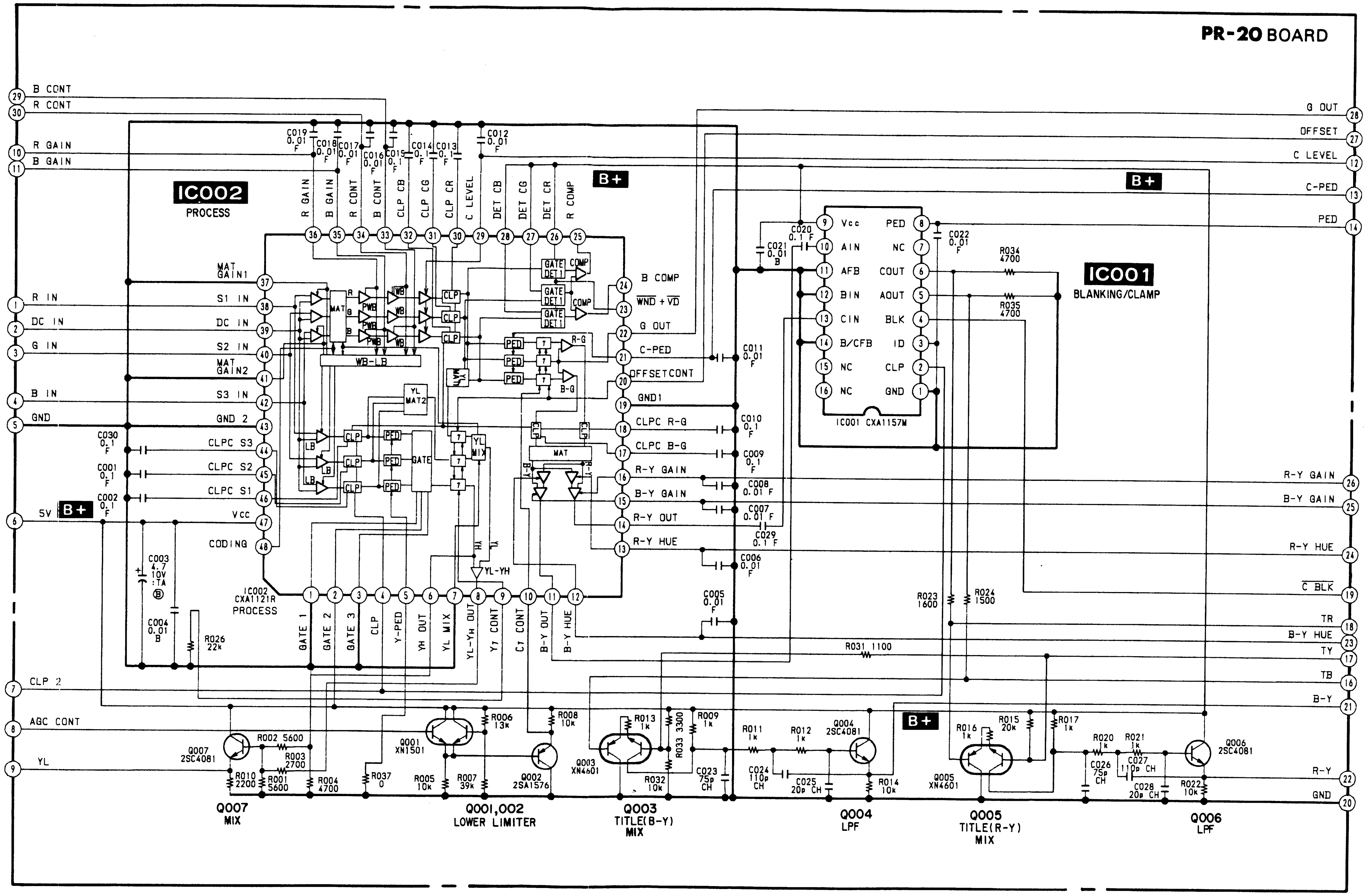

IC002 PROCESS
IC002 CXA1121R PROCESS
B CONT
R CONT
R GAIN
B GAIN
R IN
DC IN
G IN
B IN
GND
5V
CLP 2
AGC CONT
YL
Q007 MIX
Q001,002 LOWER LIMITER
Q007 2SC4081
Q001 XN1501
Q002 2SA1576

8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23

A B C D E F G H I J

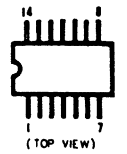

MX-7 BOARD
Q009 BUFFER
B+
R020 8200
R019 8200
Q008 XN6401
Q008 BUFFER
C1 GAIN
Y1 GAIN
C2 GAIN
C031 0.01 F
C030 0.01 F
C029 0.01 F
C028 16V TA
C027 16V TA
R MTX
B MTX
ID
C026 16V TA
C025 16V TA
C024 16V TA
R OUT
DC OUT
G OUT
IC002
MATRIX
B OUT
CS GAIN
VCS GAIN
AP GAIN
Q005 LPF
R007 4700
R008 1500
R009 1500
R010 1500
Q005 2SC4081
Q004 2SA1576
C012 150p CH
C013 39p CH
C014 220p SL
R011 10k
YL-YH
YH
YL
Q004 BUFFER
Q007 LPF
Q010 BLANKING
B+
R012 4700
R013 2200
R014 2200
R015 2200
Q007 2SC4081
R029 2200
R027 22k
CS Y
Q010 XN6401
C017 120p CH
C058 22p
Q006 2SA1576
C015 75p CH
C016 20p CH
R016 10k
R026 10k
C BLK

PR-20 board is replaced as a block so the PRINTED WIRING BOARD of it is omitted.

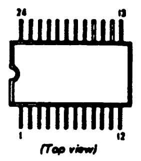

PR-20 BOARD
B CONT
R CONT
R GAIN
B GAIN
IC002
PROCESS
C019 0.01 F
C018 0.01 F
C017 0.01 F
C016 0.01 F
C015 0.1 F
C014 0.1 F
C013 0.1 F
C012 0.01 F
B+
R GAIN
B GAIN
R CONT
B CONT
CLP CB
CLP CG
CLP CR
C LEVEL
DET CB
DET CG
DET CR
R COMP
MAT GAIN1
S1 IN
DC IN
S2 IN
MAT GAIN2
S3 IN
GND 2
CLPC S3
CLPC S2
CLPC S1
Vcc
CODING
R IN
DC IN
G IN
B IN
GND
5V
B+
C030 0.1 F
C001 0.1 F
C002 0.1 F
C003 4.7 10V TA
C004 0.01 B
R026 22k
IC002 CXA1121R PROCESS
B COMP
WND + VD
G OUT
C-PED
OFFSET CONT
GND1
CLPC R-G
CLPC B-G
R-Y GAIN
B-Y GAIN
R-Y OUT
R-Y HUE
GATE 1
GATE 2
GATE 3
CLP
Y-PED
YH OUT
YL MIX
YL-YH OUT
Y1 CONT
C1 CONT
B-Y OUT
B-Y HUE
MAT
WB
PWB
CLP
WB-LB
GATE DET1
COMP
PED
R-G
B-G
YL MAT2
LB
GATE
YL MIX
YL-YH
C011 0.01 F
C010 0.1 F
C009 0.1 F
C008 0.01 F
C007 0.01 F
C029 0.1 F
C006 0.01 F
C005 0.01 F
C020 0.1 F
C021 0.01 B
C022 0.01 F
Vcc
AIN
AFB
BIN
CIN
B/CFB
NC
NC
PED
NC
COUT
AOUT
BLK
ID
CLP
GND
IC001 CXA1157M
R034 4700
R035 4700
IC001
BLANKING/CLAMP
B+
G OUT
OFFSET
C LEVEL
C-PED
PED
R-Y GAIN
B-Y GAIN
R-Y HUE
C BLK
TR
B-Y HUE
TY
TB
B-Y
R-Y
GND
R023 1600
R024 1500
R031 1100
CLP 2
AGC CONT
YL
R002 5600
R003 2700
Q007 2SC4081
R010 2200
R001 5600
R004 4700
Q007 MIX
Q001 XN1501
R037 0
R005 10k
R007 39k
R006 13k
Q002 2SA1576
R008 10k
Q001,002 LOWER LIMITER
R013 1k
R033 3300
R009 1k
Q003 XN4601
R032 10k
C023 75p CH
Q003 TITLE(B-Y) MIX
R011 1k
R012 1k
Q004 2SC4081
C024 110p CH
C025 20p CH
R014 10k
Q004 LPF
B+
R016 1k
R015 20k
R017 1k
Q005 XN4601
Q005 TITLE(R-Y) MIX
R020 1k
R021 1k
C026 75p CH
C027 110p CH
C028 20p CH
R022 10k
Q006 2SC4081
Q006 LPF

4-3. SEMICONDUCTORS

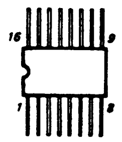
AN2512S
TC40H008F
μPD4066BG


14
8
1
7
(TOP VIEW)

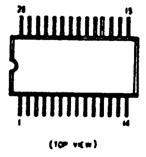
CX20114



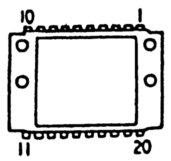
CX20115A
TC4053BF
μPD6145G-601



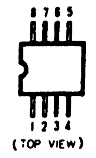
CXK58256MF-15LL



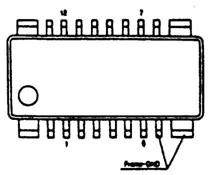
ICX027BK-2



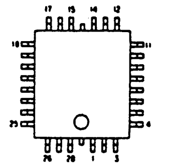
LA7293
MC34182MR
NJM2233AM
RC3414M
μPC358G2
μPC393G2


8 7 6 5
1 2 3 4
(TOP VIEW)

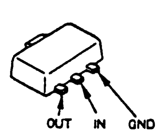
LB1631M



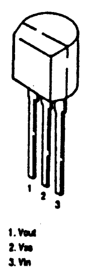
MC146805F2FPSC8253-3F



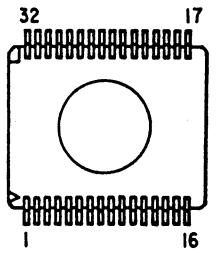
S-8054ALR-LN-S



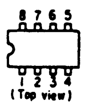
S-81350AG-REG


1
2
3
1. Vout
2. Vss
3. Vin

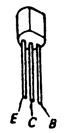
SBX1505-21



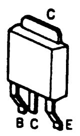
μPC311G2


8 7 6 5
1 2 3 4
(Top view)

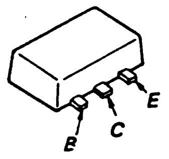
2SA733-K



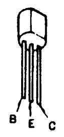
2SA1341



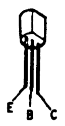
2SA1416-S
2SB804-AW
2SB1121
2SC3646-S
2SD1615



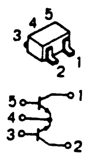
2SA1611-M6



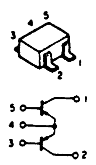
2SB926-T



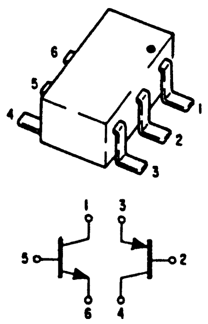
FMG2
FMW1
XN1213
XN1216


4 5
3
2
1
5
4
3
1
2

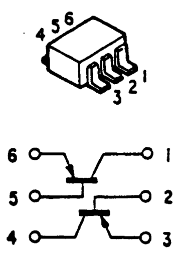
FMS1
FMY3
XN1113


4 5
3
2
1
5
4
3
1
2

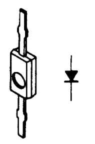
IMD2
XN4601


6
5
4
1
2
3
1 3
5
2
6 4

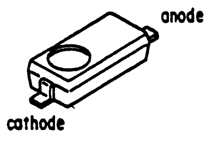
IMT1US


4 5 6
3 2 1
6
5
4
1
2
3

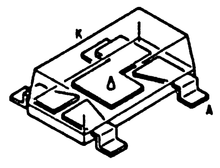
1T32-2



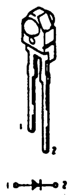
1T33C-01


anode
cathode

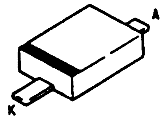
GL1HD51



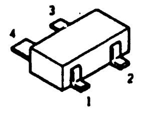
GL452S



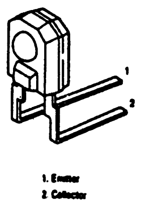
MA110



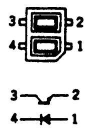
DWA010



PT480FI

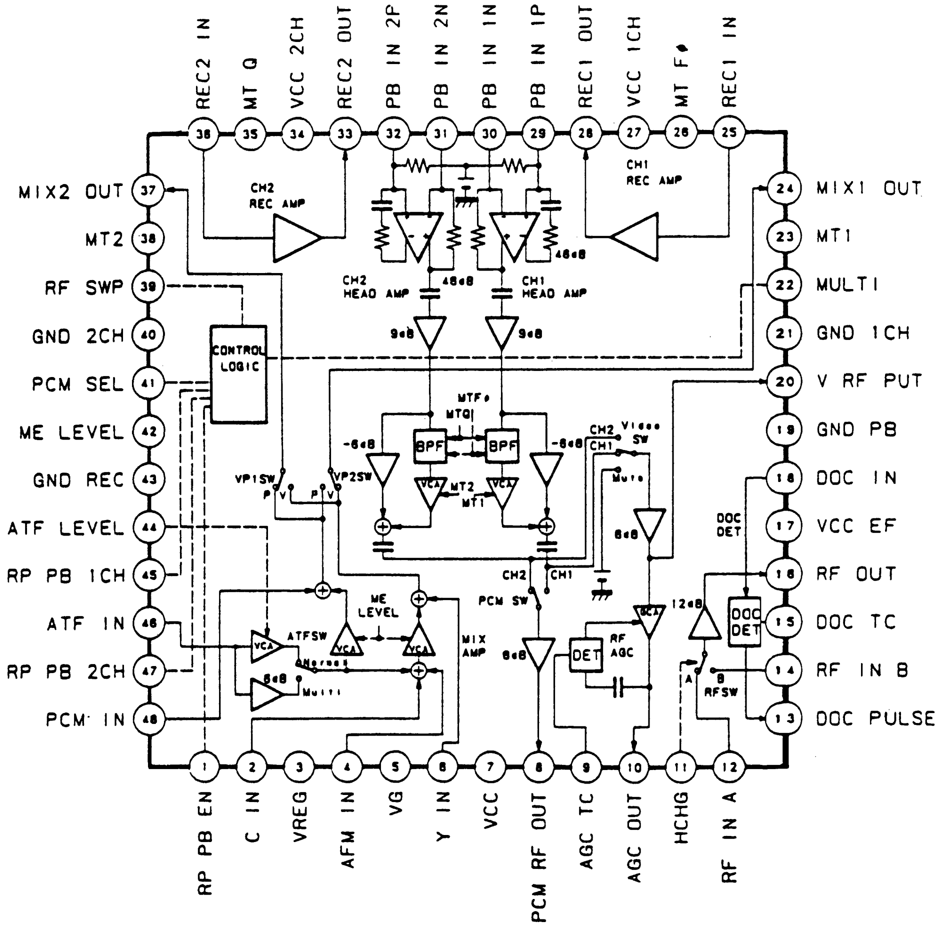

1
2
1. Emitter
2. Collector

TLP907-0

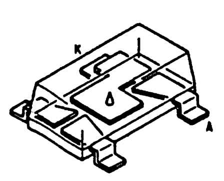


• VIDEO/AUDIO BLOCK IC BLOCK DIAGRAMS
(FOR IC BLOCK DIAGRAM, SEE PAGE 115 to 119.)

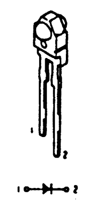
IC301 (SS-93P)
CXA1202Q-Z/
CXA1202R


REC2 IN
MT Q
VCC 2CH
REC2 OUT
PB IN 2P
PB IN 2N
PB IN 1N
PB IN 1P
REC1 OUT
VCC 1CH
MT F0
REC1 IN
MIX2 OUT
MT2
RF SWP
GND 2CH
PCM SEL
ME LEVEL
GND REC
ATF LEVEL
RP PB 1CH
ATF IN
RP PB 2CH
PCM IN
MIX1 OUT
MT1
MULTI
GND 1CH
V RF PUT
GND PB
DOC IN
VCC EF
RF OUT
DOC TC
RF IN B
DOC PULSE
RP PB EN
C IN
VREG
AFM IN
VG
Y IN
VCC
PCM RF OUT
AGC TC
AGC OUT
HCHG
RF IN A
CH2 REC AMP
CH1 REC AMP
CH2 HEAD AMP
CH1 HEAD AMP
CONTROL LOGIC
BPF
VCA
MT2
MT1
ME LEVEL
MIX AMP
PCM SW
ATFSW
RF AGC
DET
DOC DET
RFSW
Video SW
Mute

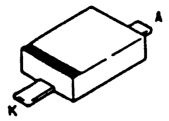
GL1HD51



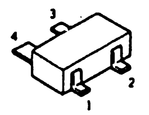
GL452S



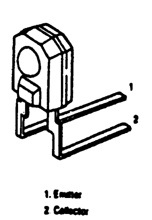
MA110



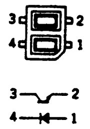
DWA010



PT480FI

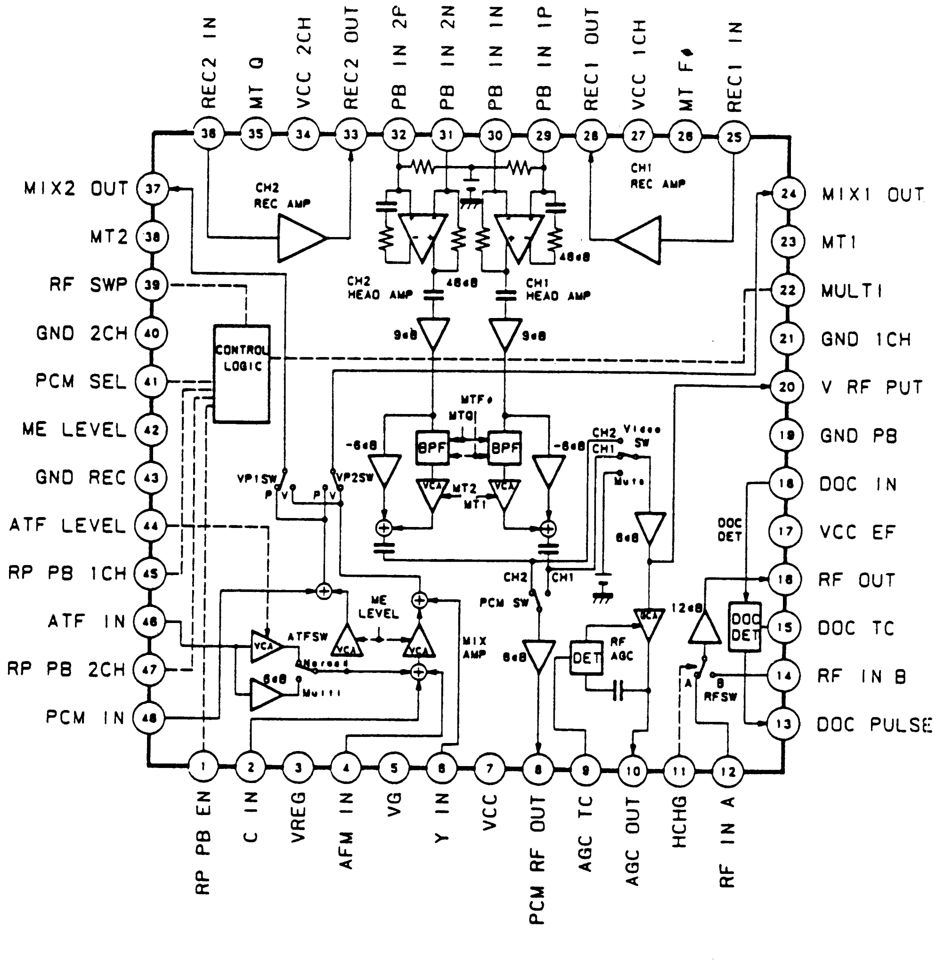

1
2
1. Emitter
2. Collector

TLP907-0

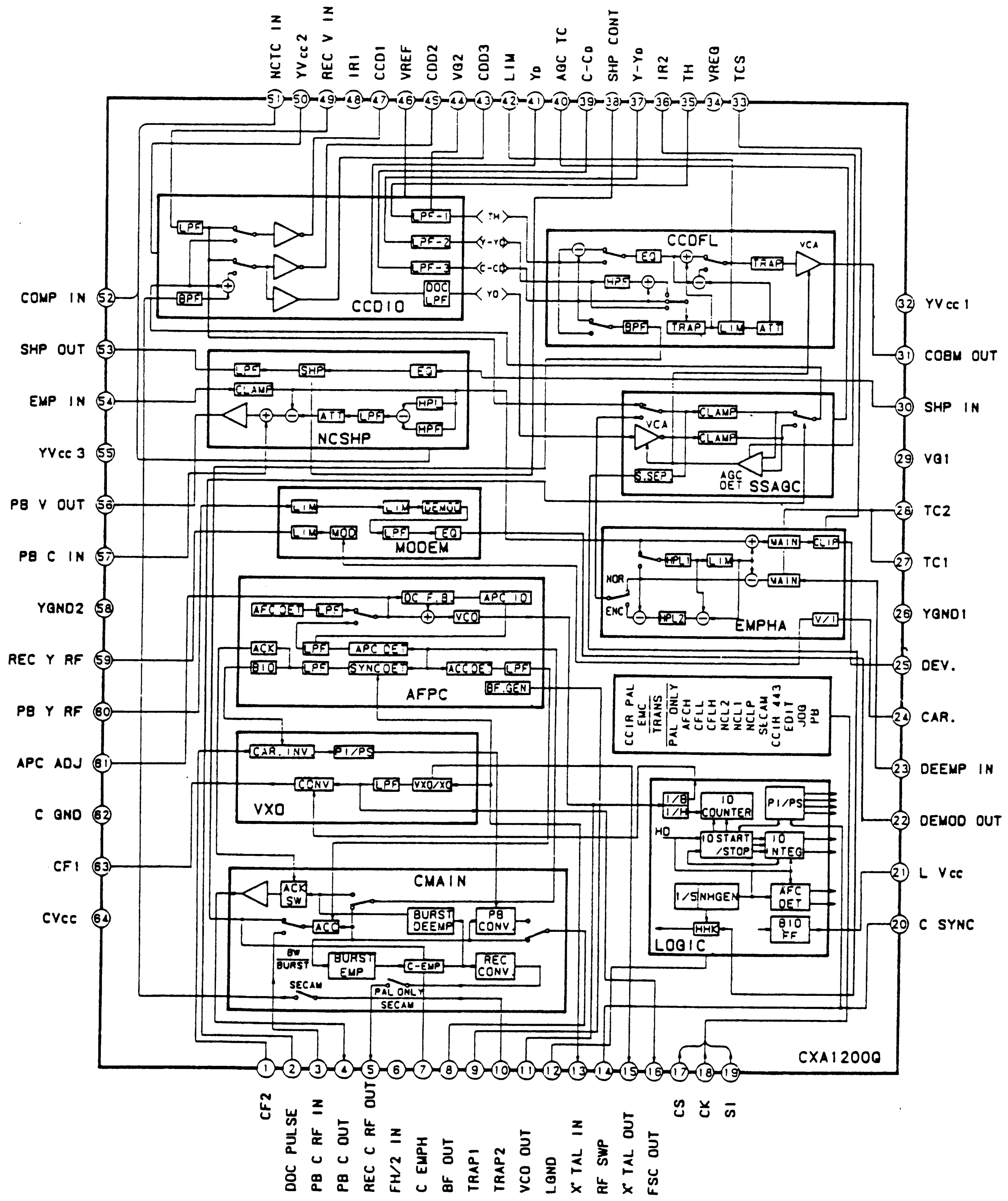


• VIDEO/AUDIO BLOCK IC BLOCK DIAGRAMS
(FOR IC BLOCK DIAGRAM, SEE PAGE 115 to 119.)

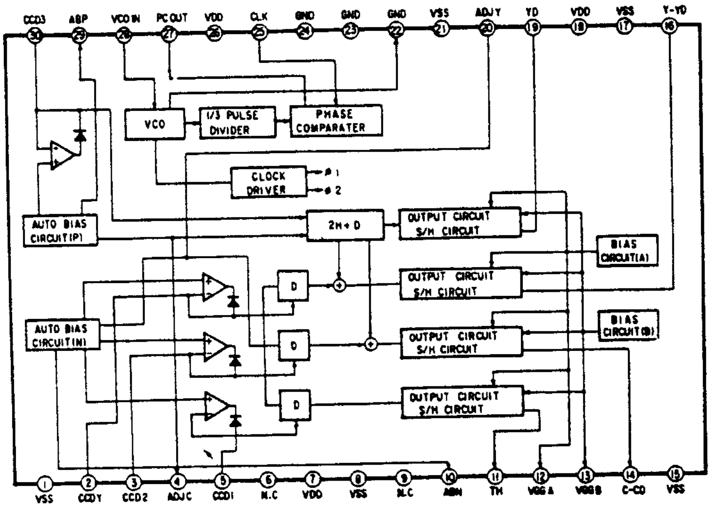
IC301 (SS-93P)
CXA1202Q-Z/
CXA1202R


REC2 IN 36
MT Q 35
VCC 2CH 34
REC2 OUT 33
PB IN 2P 32
PB IN 2N 31
PB IN IN 30
PB IN 1P 29
REC1 OUT 28
VCC 1CH 27
MT F 26
REC1 IN 25
MIX2 OUT 37
MT2 38
RF SWP 39
GND 2CH 40
PCM SEL 41
ME LEVEL 42
GND REC 43
ATF LEVEL 44
RP PB 1CH 45
ATF IN 46
RP PB 2CH 47
PCM IN 48
MIX1 OUT 24
MT1 23
MULTI 22
GND 1CH 21
V RF PUT 20
GND PB 19
DOC IN 18
VCC EF 17
RF OUT 16
DOC TC 15
RF IN B 14
DOC PULSE 13
RP PB EN 1
C IN 2
VREG 3
AFM IN 4
VG 5
Y IN 6
VCC 7
PCM RF OUT 8
AGC TC 9
AGC OUT 10
HCHG 11
RF IN A 12
CH2 REC AMP
CH1 REC AMP
CH2 HEAD AMP
CH1 HEAD AMP
48dB
9dB
CONTROL LOGIC
MTF
MTQ
BPF
-6dB
VP1SW
VP2SW
MT2
MT1
CH2 Video SW CH1
Mute
6dB
DOC DET
ME LEVEL
ATFSW
VCA
Multi
MIX AMP
PCM SW
DET
RF AGC
12dB
RFSW

IC360 (VA-43) CXA1200Q

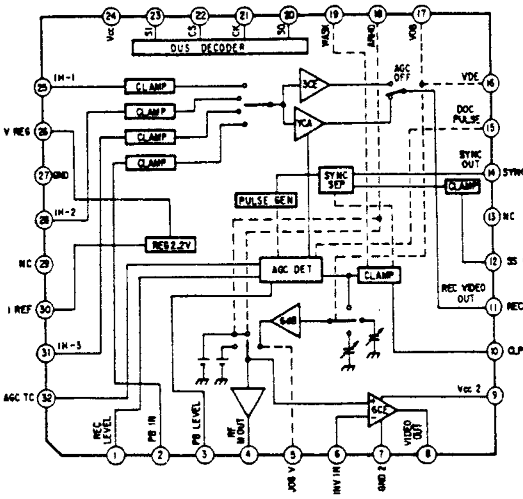

NCTC IN 51
YVcc2 50
REC V IN 49
IR1 48
CCD1 47
VREF 46
CCD2 45
VG2 44
CCD3 43
LIM 42
Yo 41
AGC TC 40
C-Co 39
SHP CONT 38
Y-Yo 37
IR2 36
TH 35
VREG 34
TCS 33
COMP IN 52
SHP OUT 53
EMP IN 54
YVcc3 55
PB V OUT 56
PB C IN 57
YGND2 58
REC Y RF 59
PB Y RF 60
APC ADJ 61
C GND 62
CF1 63
CVcc 64
YVcc1 32
COBM OUT 31
SHP IN 30
VG1 29
TC2 28
TC1 27
YGND1 26
DEV. 25
CAR. 24
DEEMP IN 23
DEMOD OUT 22
L Vcc 21
C SYNC 20
CF2 1
DOC PULSE 2
PB C RF IN 3
PB C OUT 4
REC C RF OUT 5
FH/2 IN 6
C EMPH 7
BF OUT 8
TRAP1 9
TRAP2 10
VCO OUT 11
LGND 12
X'TAL IN 13
RF SWP 14
X'TAL OUT 15
FSC OUT 16
CS 17
CK 18
SI 19
LPF
BPF
CCDIO
LPF-1
LPF-2
LPF-3
DOC LPF
TH
Y-Yo
C-Co
Yo
CCDFL
VCA
EQ
HPF
TRAP
LIM
ATT
NCSHP
SHP
CLAMP
HPF
SSAGC
AGC DET
S.SEP
MODEM
DEMOD
LPF
EMPHA
MAIN
CLIP
HPL1
HPL2
NOR
ENC
V/I
AFPC
APC DET
DC F.B
APC IO
VCO
ACK
BIO
SYNC DET
ACC DET
BF GEN
VXO
CAR. INV
PI/PS
CCNV
VXO/XO
CMAIN
ACK SW
ACC
BURST DEEMP
PB CONV
BW BURST
BURST EMP
C-EMP
REC CONV
SECAM
PAL ONLY SECAM
CCIR PAL
EMC
TRANS
PAL ONLY
AFCH
CFLL
CFLH
NCL1
NCL2
NCLP
SECAM
CCIH 443
EDIT
JOG
PH
1/8
1/H
IO COUNTER
PI/PS
HD
IO START /STOP
IO INTEG
1/S
HHGEN
AFC DET
BIO FF
MMK
LOGIC
CXA1200Q

IC361 (VA-43) CXL1502



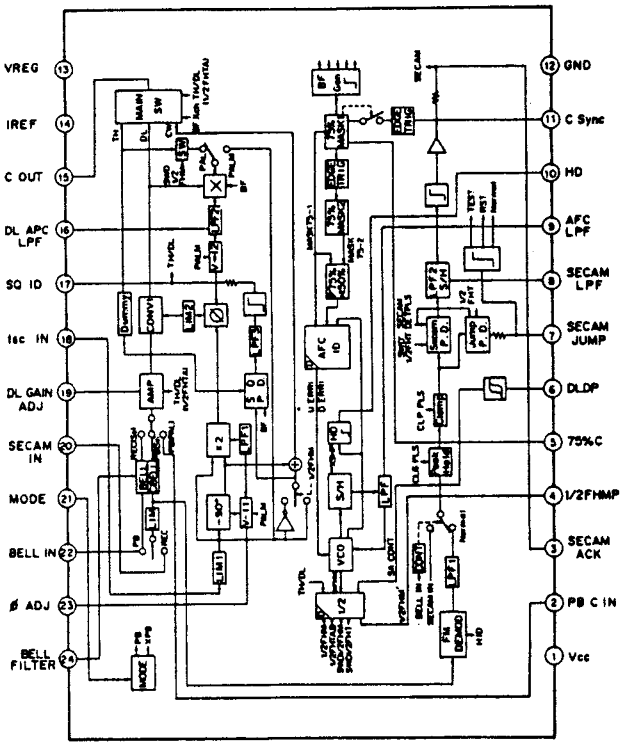
CCD3 30
ABP 29
VCO IN 28
PC OUT 27
VDD 26
CLK 25
GND 24
GND 23
GND 22
VSS 21
ADJ Y 20
YD 19
VDD 18
VSS 17
Y-YD 16
VCO
1/3 PULSE DIVIDER
PHASE COMPARATER
CLOCK DRIVER
ϕ 1
ϕ 2
AUTO BIAS CIRCUIT(P)
2H+D
OUTPUT CIRCUIT S/H CIRCUIT
BIAS CIRCUIT(A)
AUTO BIAS CIRCUIT(N)
D
BIAS CIRCUIT(B)
1 VSS
2 CCD Y
3 CCD2
4 ADJ C
5 CCD1
6 N.C
7 VDD
8 VSS
9 N.C
10 ABN
11 TH
12 VGG A
13 VGG B
14 C-CD
15 VSS

IC362 (VA-43) CXA1201Q



24 Vcc
23 SI
22 CS
21 CK
20 SO
19 MASK
18 APND
17 VOB
DUS DECODER
25 IN-1
CLAMP
26 V REG
27 GND
28 IN-2
29 NC
30 I REF
31 IN-3
32 AGC TC
3CE
VCA
AGC OFF
16 VDE
15 DOC PULSE
SYNC OUT
14 SYNC
SYNC SEP
PULSE GEN
13 NC
REG 2.2V
12 SS IN
AGC DET
11 REC V
REC VIDEO OUT
6dB
10 CLP IN
9 Vcc 2
6CE
1 REC LEVEL
2 PB IN
3 PB LEVEL
4 RF M OUT
5 JOB V
6 INV IN
7 GND 2
8 VIDEO OUT

IC363 (VA-43) CXA1203M



VREG 13
IREF 14
C OUT 15
DL APC LPF 16
SQ ID 17
fsc IN 18
DL GAIN ADJ 19
SECAM IN 20
MODE 21
BELL IN 22
ϕ ADJ 23
BELL FILTER 24
12 GND
11 C Sync
10 HD
9 AFC LPF
8 SECAM LPF
7 SECAM JUMP
6 DLDP
5 75%C
4 1/2FHMP
3 SECAM ACK
2 PB C IN
1 Vcc
MAIN SW
TH
DL
CW
Dummy
CONV
LIM2
AMP
BELL
LIM
PB
REC
MODE
LPF2
LPF3
LPF1
S D P D
x2
-90°
LIM1
PAL
SECAM
BF
Gen
TSK MASK
EDGE TRIG
75% MASK
75% +50%
AFC ID
HD
S/H
LPF
VCO
1/2
SA CONT
LPF2 S/H
Secam P.D.
Jump P.D.
Clamp
Peak Hold
CONT
LPF1
FM DEMOD
TEST
RST
Normal
CLP PLS
SECAM IN
BELL IN

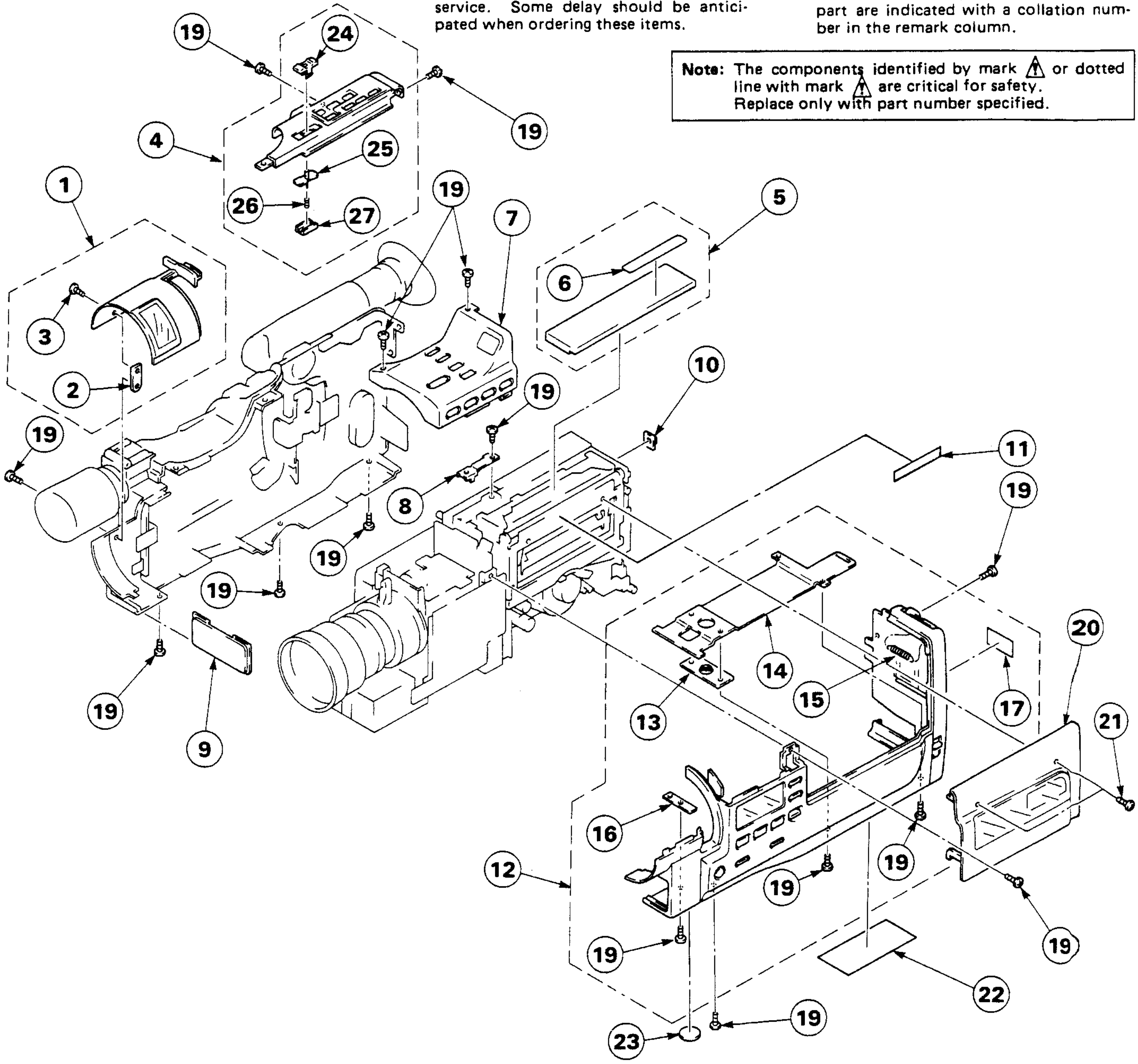
SECTION 5
EXPLODED VIEWS

5-1. RIGHT CABINET ASSEMBLY

NOTE:

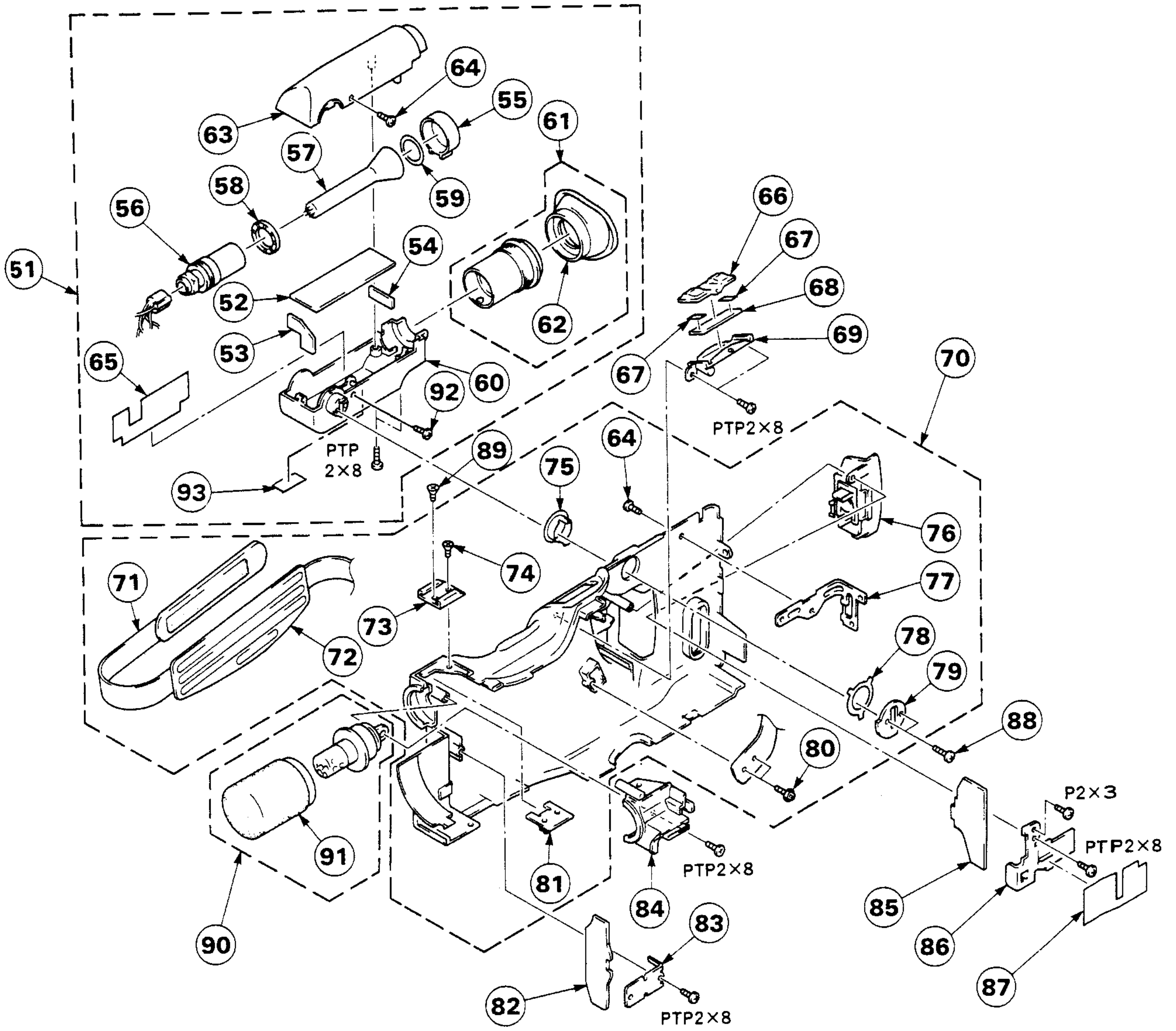
- The mechanical parts with no reference number in the exploded views are not supplied.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- Due to standardization, parts with part number suffix -XX and -X may be different from the parts specified in the components used on the set.
- The construction parts of an assembled part are indicated with a collation number in the remark column.

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.



No.	Part No.	Description	Remark
1	X-3725-198-1	COVER ASSY, LENS	2, 3
2	3-727-915-01	NUT, PLATE	
3	3-732-988-01	SCREW (M2X2.5)	
4	X-3726-549-1	PANEL (A) ASSY, VTR	24-27
5	X-3726-505-1	LID ASSY, LS	6
6	*3-713-908-01	LABEL, CAUTION, LS LID	
7	X-3726-507-1	PANEL (A) ASSY, CAMERA	
8	3-735-408-01	BRACKET, CABINET	
9	X-3726-502-1	PLATE ASSY, LIGHT TRANSMISSION	
10	3-724-593-01	KEY TOP	
11	3-697-539-01	LABEL, CAUTION	
12	X-3726-508-1	CABINET (RIGHT) ASSY	13-17, 19
13	3-730-899-01	SHEET METAL, TRIPOD FIXED	
14	*3-735-425-01	SHEET METAL, TRIPOD	
15	3-669-440-00	SPRING, TENSION	
16	3-730-898-01	JOINT, L-R	
17	*3-719-683-01	LABEL, BATTERY FITTING	
19	3-719-381-01	SCREW (M2X4)	
20	X-3726-548-1	LID (A) ASSY, CASSETTE	
21	3-713-791-01	SCREW (M1.7X5), TAPPING, P2	
22	*3-704-235-01	LABEL, CAUTION (UK MODEL)	
22	*3-704-256-01	LABEL, CAUTION (UK MODEL)	
22	*3-735-483-01	LABEL, MODEL NUMBER (AEP MODEL)	
22	*3-738-508-01	LABEL, MODEL NUMBER (UK, AUS, E MODEL)	
23	3-725-181-01	CAP, LOWER, AF	
24	3-724-586-01	KEY TOP, POWER	
25	3-724-587-51	BUTTON, P LOCK	
26	3-303-973-00	SPRING, COMPRESSION	
27	3-724-503-01	PLATE (B), BLIND, POWER	

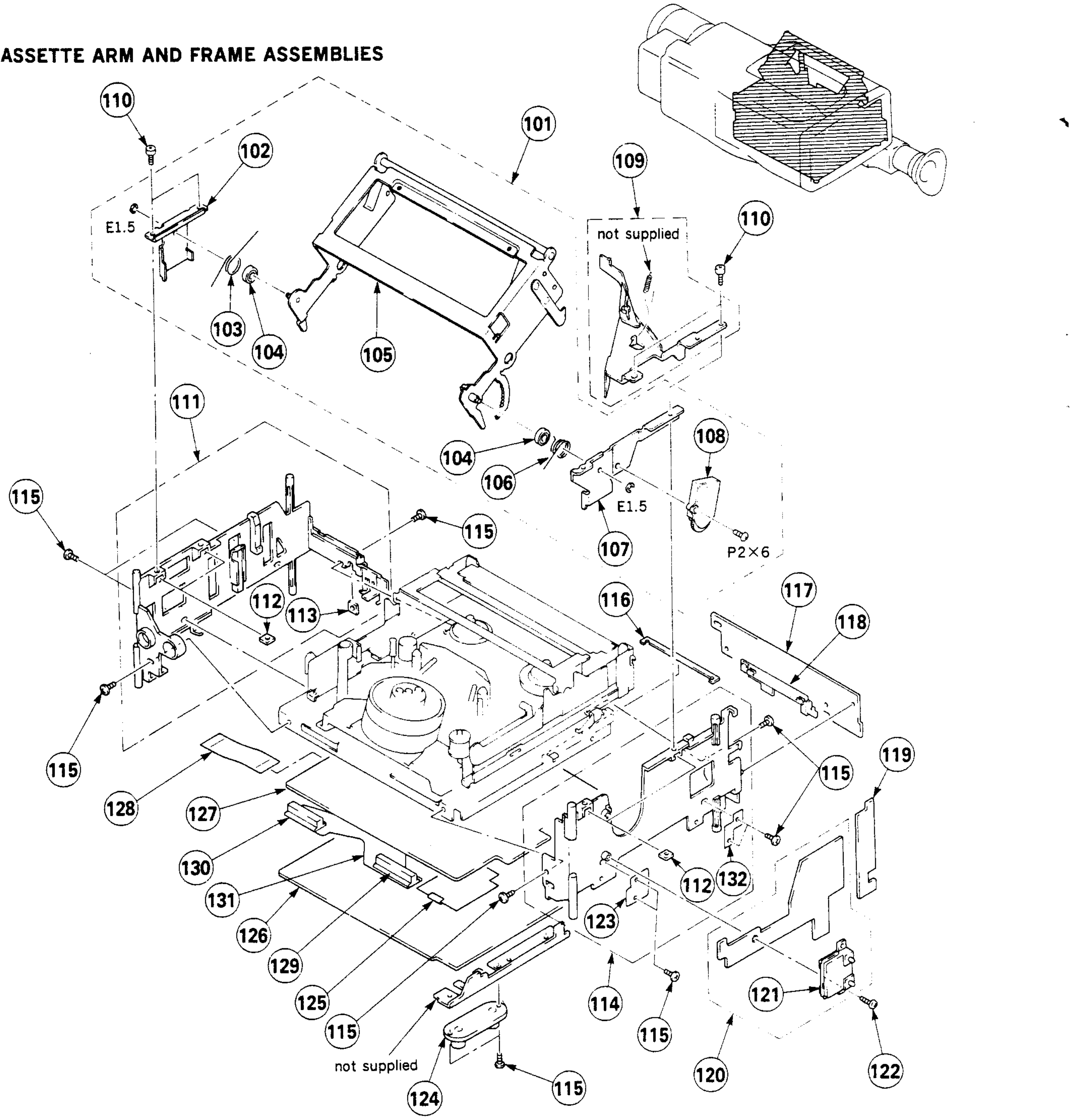
5-2. LEFT CABINET ASSEMBLY



Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

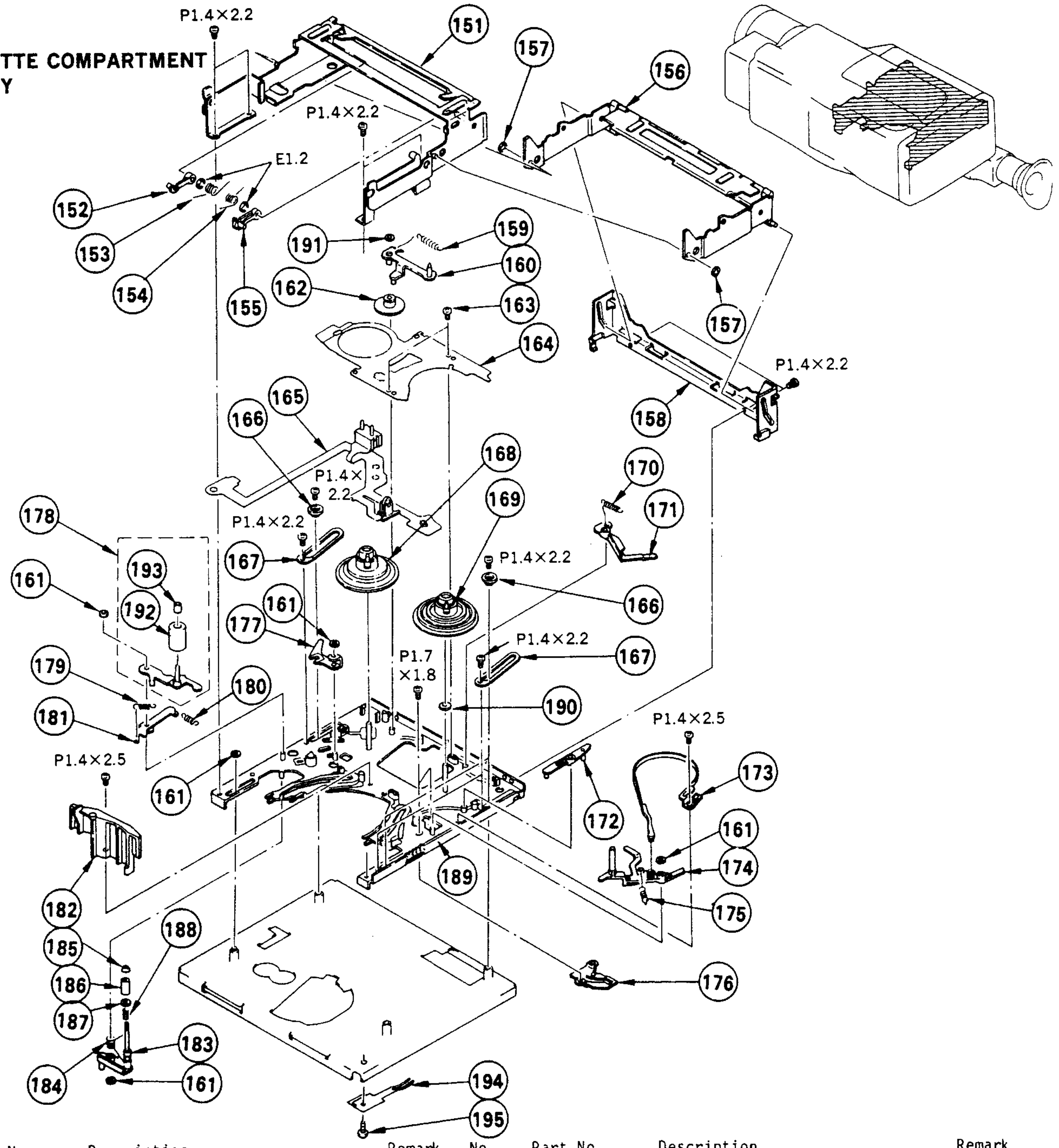
No.	Part No.	Description	Remark
51	A-7019-099-A	EVF BLOCK ASSY	52-65, 92
52	*A-7061-236-A	VF-13P BOARD, COMPLETE	
53	*A-7070-728-A	TL-18 BOARD, COMPLETE	
54	*A-7070-729-A	TL-19 BOARD, COMPLETE	
55	X-3724-509-1	HOLDER ASSY, CRT	
56	⚠.1-451-310-21	DEFLECTION YOKE (B/W) (L951)	
57	⚠.1-546-065-11	CATHODE-RAY TUBE, B/W (MOIJVV47WB)(V901)	
58	3-724-549-01	LOCK, CRT	
59	3-724-570-01	RING, CRT FIXED	
60	A-7080-486-A	CABINET (LOWER) ASSY, EVF	
61	A-7080-715-A	HOLDER BLOCK ASSY, FINDER	62
62	3-733-922-01	EYE CUP	
63	X-3724-508-1	CABINET (UPPER) ASSY, EVF	
64	3-719-381-01	SCREW (M2X4)	
65	*3-725-156-01	INSULATOR (B), EVF	
66	3-724-526-01	BUTTON, ZOOM	
67	*2-532-810-00	CUSHION, 15X5X0.3	
68	*1-630-454-21	ZM-10P BOARD	
69	3-735-420-01	BASE, ZOOM BUTTON	
70	A-7080-846-A	CABINET (LEFT) BLOCK ASSY	64, 71-81
71	*3-724-582-01	BELT, GRIP	
72	3-724-591-01	PAD, GRIP	
73	3-724-511-01	SHOE, ACCESSORY	
74	3-719-831-21	SCREW (M2X4)	
75	3-724-514-01	SLEEVE, EVF	
76	X-3724-564-1	BASE ASSY, SP	
77	3-724-525-01	BRACKET (UPPER), STRAP	
78	3-724-512-01	SPRING	
79	3-724-513-01	PLATE, LOCK	
80	3-669-480-21	+ PTPWH 2	
81	*3-735-407-01	SHEET METAL, ACC	
82	*A-7061-716-A	MC-36P BOARD, COMPLETE	
83	*3-735-406-01	SHEET METAL, MC	
84	3-735-430-01	HOUSING, MICROPHONE	
85	*1-630-453-21	SW-111P BOARD	
86	*3-724-569-01	SHEET METAL, SP	
87	*3-725-153-01	SHEET, INSULATING, SHEET METAL	
88	3-713-792-01	SCREW (M2X10)	
89	3-713-787-01	SCREW (M2x4)	
90	*1-542-125-11	MICROPHONE (C-2027)	91
91	3-707-650-01	SCREEN, WIND	
92	3-713-786-21	SCREW (M2X3)	
93	3-704-235-01	LABEL, CAUTION (UK)	

5-3. CASSETTE ARM AND FRAME ASSEMBLIES


110
102
101
E1.5
109
not supplied
110
103
104
105
111
104
108
106
E1.5
107
P2×6
115
115
112
113
116
117
118
115
119
115
128
127
130
131
112
132
123
126
129
125
114
121
115
115
120
122
not supplied
124
115

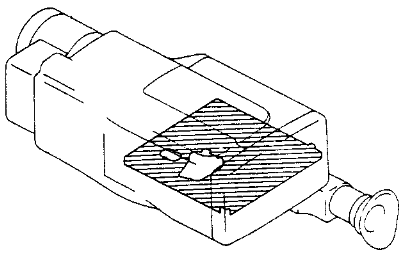
No.	Part No.	Description	Remark
101	A-7040-141-A	ARM BLOCK ASSY (3), CASSETTE	
102	*3-719-606-01	PLATE (T2) (M), SIDE	
103	3-695-582-01	SPRING, TORSION	
104	3-695-512-02	COLLAR, CASSETTE ARM	
105	X-3712-034-4	ARM ASSY (2), CASSETTE	
106	3-695-581-01	SPRING, TORSION	
107	3-695-641-01	PLATE (S2), SIDE	
108	3-681-528-11	DAMPER	
109	A-7040-140-B	GUARD BLOCK ASSY, TAPE	102-108
110	3-719-697-01	SCREW (M1.7X5), SPECIAL HEAD	
111	*X-3724-503-1	FRAME (F) ASSY, MD	112, 113
112	3-716-418-01	NUT, FRAME PLATE	
113	3-718-233-01	NUT, PLATE	
114	*X-3724-504-1	FRAME (R) ASSY, MD	112, 123, 132
115	3-719-695-01	SCREW (M1.7X3.5), SPECIAL HEAD	
116	3-725-136-01	REINFORCEMENT, VA-SS	
117	*1-631-595-11	FV-4P BOARD	
118	3-724-537-01	HOLDER, FV PC BOARD	
119	*1-631-594-11	EJ-9P BOARD	
120	*1-630-455-21	PA-24P BOARD	
121	1-535-658-11	TERMINAL BOARD	
122	3-719-601-01	SCREW (B2X5), TAPPING	
123	*3-725-143-01	SHEET (A), ELECTROSTATIC	
124	1-537-142-11	TERMINAL BOARD	
125	*3-726-558-01	PLATE, SHIELD, VA-SS	
126	*A-7061-713-A	VA-43 BOARD, COMPLETE	
127	*A-7061-714-A	SS-93P BOARD, COMPLETE	116
128	1-574-462-11	CABLE, FLAT (1.0MM PITCH) 15P	
129	1-562-879-11	CONNECTOR, CARD EDGE 19P	
130	1-562-879-11	CONNECTOR, CARD EDGE 15P	
131	1-626-231-11	FP-118 FLEXIBLE BOARD	
132	*3-725-152-01	SHEET (B), ELECTROSTATIC	

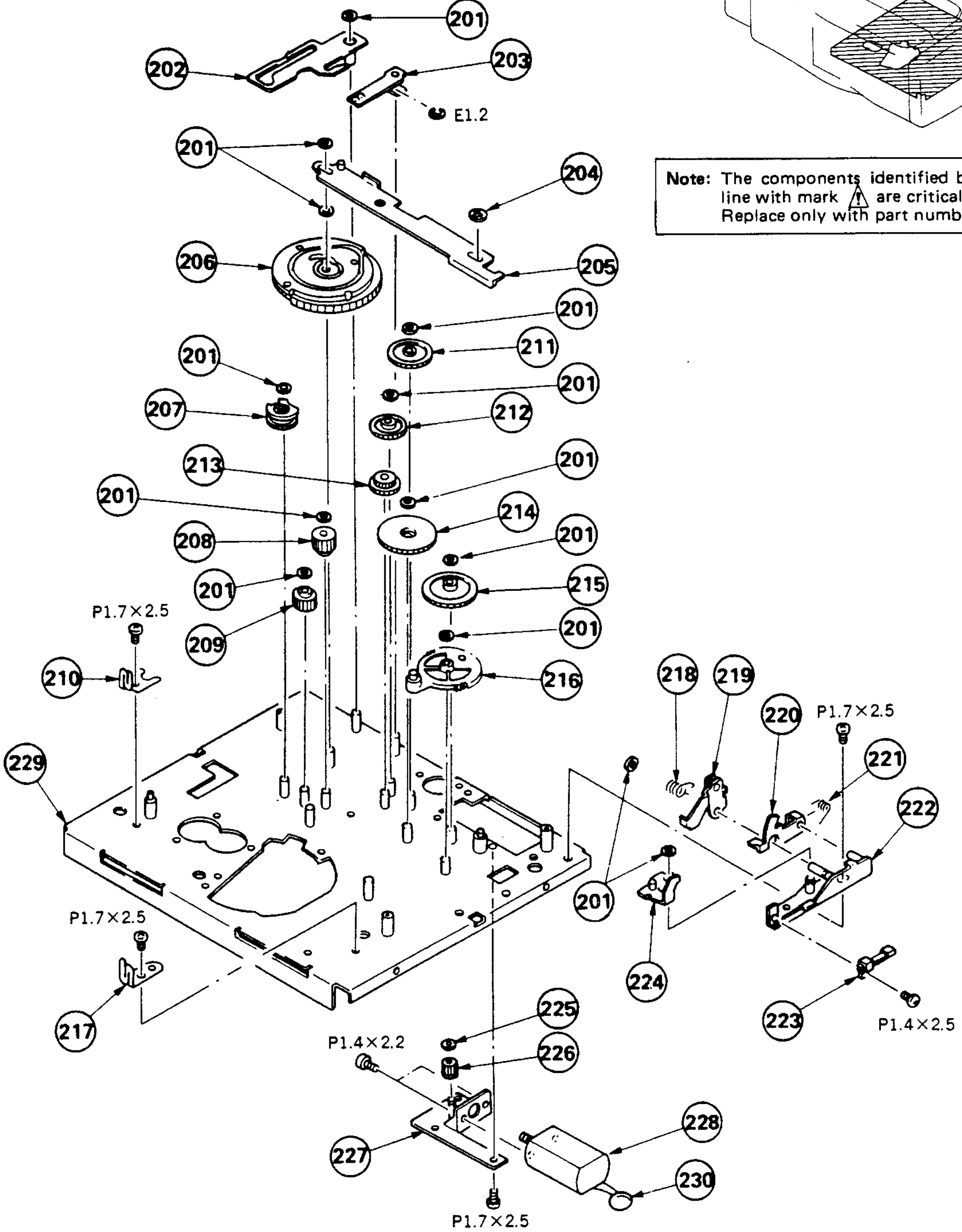
5-4. LS CASSETTE COMPARTMENT ASSEMBLY


P1.4×2.2
151
157
156
P1.4×2.2
E1.2
152
153
154
155
191
159
160
162
163
157
164
P1.4×2.2
158
165
166
P1.4×2.2
168
170
169
171
178
P1.4×2.2
167
193
P1.4×2.2
166
161
192
161
177
P1.4×2.2
167
P1.7
×1.8
179
180
190
181
P1.4×2.5
P1.4×2.5
173
161
172
161
174
189
175
182
188
185
176
186
187
183
184
161
194
195

No.	Part No.	Description	Remark
151	X-3695-447-6	COMPARTMENT ASSY, CASSETTE, LS	
152	3-695-595-01	RETAINER (T), CASSETTE	
153	3-695-605-01	SPRING, TORSION	
154	3-695-604-01	SPRING, TORSION	
155	3-695-594-01	RETAINER (S), CASSETTE	
156	X-3695-448-3	ARM ASSY, BLIND	
157	3-669-465-00	WASHER (1.5), STOPPER	
158	3-695-646-01	ARM, LS	
159	3-695-718-01	SPRING, TENSION	
160	X-3712-037-1	LEVER (A) ASSY (2)	
161	3-315-384-31	WASHER, STOPPER	
162	X-3712-025-1	GEAR ASSY, TS	
163	3-699-402-01	SCREW (M1.3X5.5), TAPPING	
164	3-712-165-01	PLATE (2), STOPPER	
165	A-7060-693-A	FP-53 BOARD, COMPLETE	
166	3-695-698-01	GUIDE, LS	
167	3-695-697-01	SPRING, LEAF, LS	
168	X-3695-436-1	TABLE ASSY, REEL, TAKE-UP	
169	X-3712-038-1	TABLE ASSY (2), REEL, SUPPLY	190
170	3-542-475-00	SPRING, TENSION	
171	3-712-151-01	BRAKE (2), SOFT	
172	3-695-735-04	ARM, TG1 RELEASE	
173	X-3695-432-1	BAND ASSY, TG1	
174	X-3712-019-1	ARM ASSY (2), TG1	
175	3-695-591-01	SPRING, TENSION	
176	3-695-733-01	PLATE, CAM, LS	
177	X-3712-022-1	ARM (B) ASSY (2), PINCH	
178	X-3712-032-2	ARM (C) ASSY (2), PINCH	192, 193
179	3-695-622-01	SPRING, TENSION	
180	3-695-719-01	SPRING, TENSION	
181	X-3695-415-1	PINCH LEVER ASSY	
182	3-695-624-01	BASE, PROTECT	
183	X-3712-027-1	ARM ASSY (2), TG7	
184	3-695-541-01	SPRING	
185	3-712-158-01	FLANGE, UPPER, TG7	
186	3-712-160-01	SLEEVE (2), TG7	
187	3-712-159-01	FLANGE, LOWER, TG7	
188	3-712-157-01	SPRING, COMPRESSION	
189	X-3713-962-1	CHASSIS ASSY (2), LS	
190	3-701-444-01	WASHER, 6	
191	3-321-393-01	WASHER, STOPPER	
192	X-3695-416-1	PINCH ROLLER ASSY	
193	3-695-569-01	SLEEVE (P), PINCH INNER	
194	*3-725-151-01	PLATE, GROUND, RP	
195	3-719-695-21	SCREW (M1.7X3.5), SPECIAL HEAD	

5-5. CHASSIS ASSEMBLY (1)

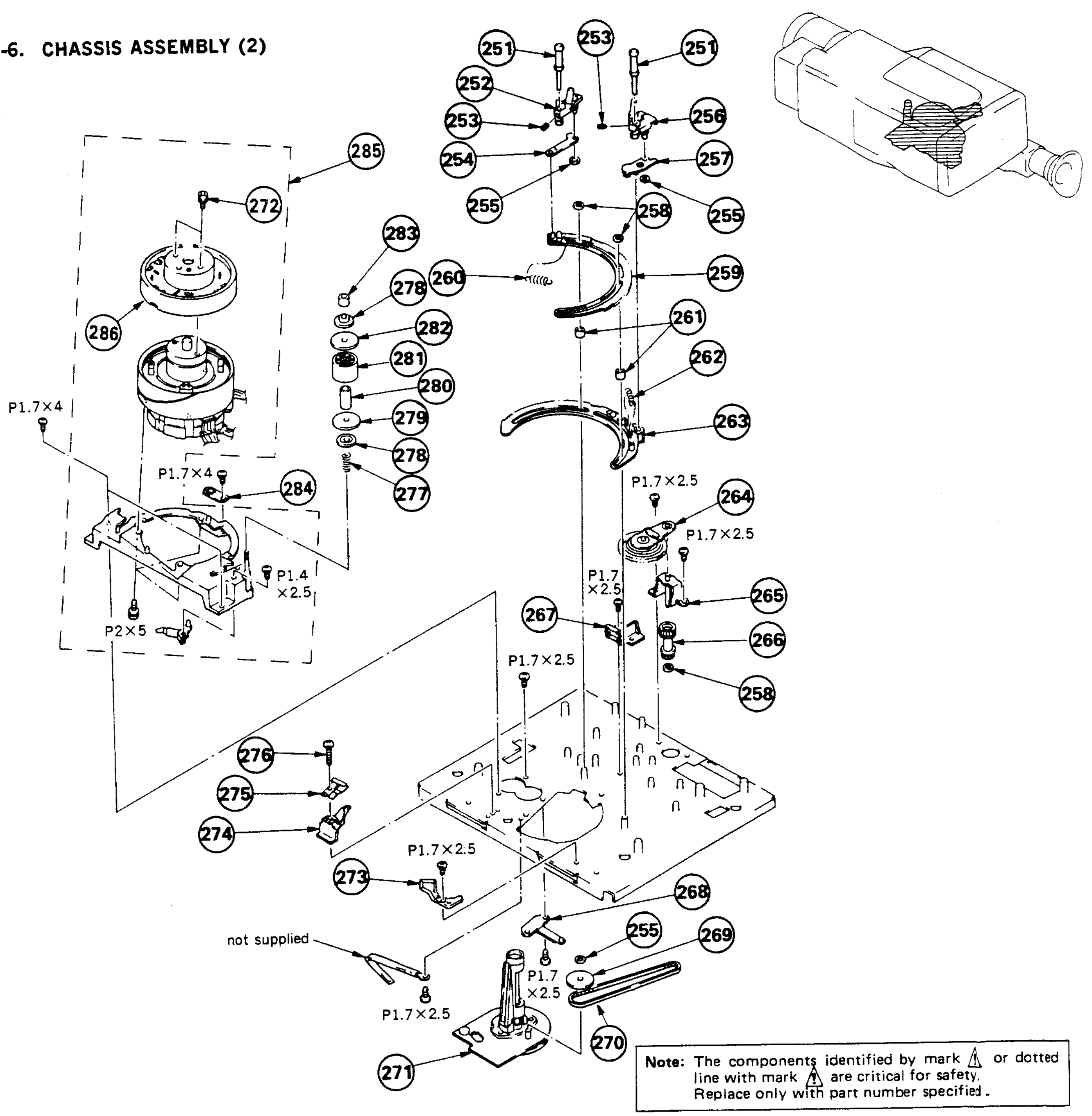



201
202
203
E1.2
201
204
206
205
201
211
201
201
207
212
213
201
201
214
208
201
201
215
P1.7×2.5
209
201
210
216
218
219
220
P1.7×2.5
229
221
222
201
P1.7×2.5
224
217
225
223
P1.4×2.5
P1.4×2.2
226
228
227
230
P1.7×2.5

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

No.	Part No.	Description	Remark
201	3-315-384-31	WASHER, STOPPER	
202	X-3712-023-1	ARM (A) ASSY (2), PINCH	
203	3-695-589-01	LEVER (B), REEL LOCK	
204	3-669-465-00	WASHER (1.5), STOPPER	
205	X-3695-439-4	SLIDER ASSY, M	
206	X-3712-031-1	CAM ASSY (2)	
207	3-712-156-01	GEAR (M) (2), THREADING	
208	3-695-537-01	GEAR (T), THREADING	
209	3-695-536-01	GEAR (S), THREADING	
210	3-695-706-01	SPRING (T)	
211	3-695-559-01	GEAR (B), THREADING	
212	3-695-724-01	GEAR (D), THREADING	
213	3-712-162-02	GEAR (C) (2), THREADING	
214	3-695-714-01	GEAR (A), LS	
215	3-695-563-04	GEAR (B), LS	
216	X-3695-417-1	GEAR (C) ASSY, LS	
217	3-695-705-01	SPRING (S)	
218	3-713-937-01	SPRING (A) (2)	
219	X-3695-418-1	ARM ASSY, LOCK	
220	3-695-574-01	ARM, RETURN PREVENTION	
221	3-695-579-01	SPRING (B), TORSION	
222	X-3712-018-1	BASE ASSY (2), LOCK	
223	1-553-226-00	SWITCH, LEAF (CASSETTE DOWN)	
224	X-3695-438-1	ARM ASSY, EJECT	
225	3-321-393-01	WASHER, STOPPER	
226	3-712-150-01	WHEEL, WORM	
227	X-3712-017-1	HOLDER ASSY, MOTOR	
228	⚠1-541-508-11	MOTOR, DC (LA14-323F) (M903)	
229	X-3712-036-1	CHASSIS ASSY (2), MECHANICAL	
230	1-161-051-00	CERAMIC CAPACITOR 0.01MF (C901)	

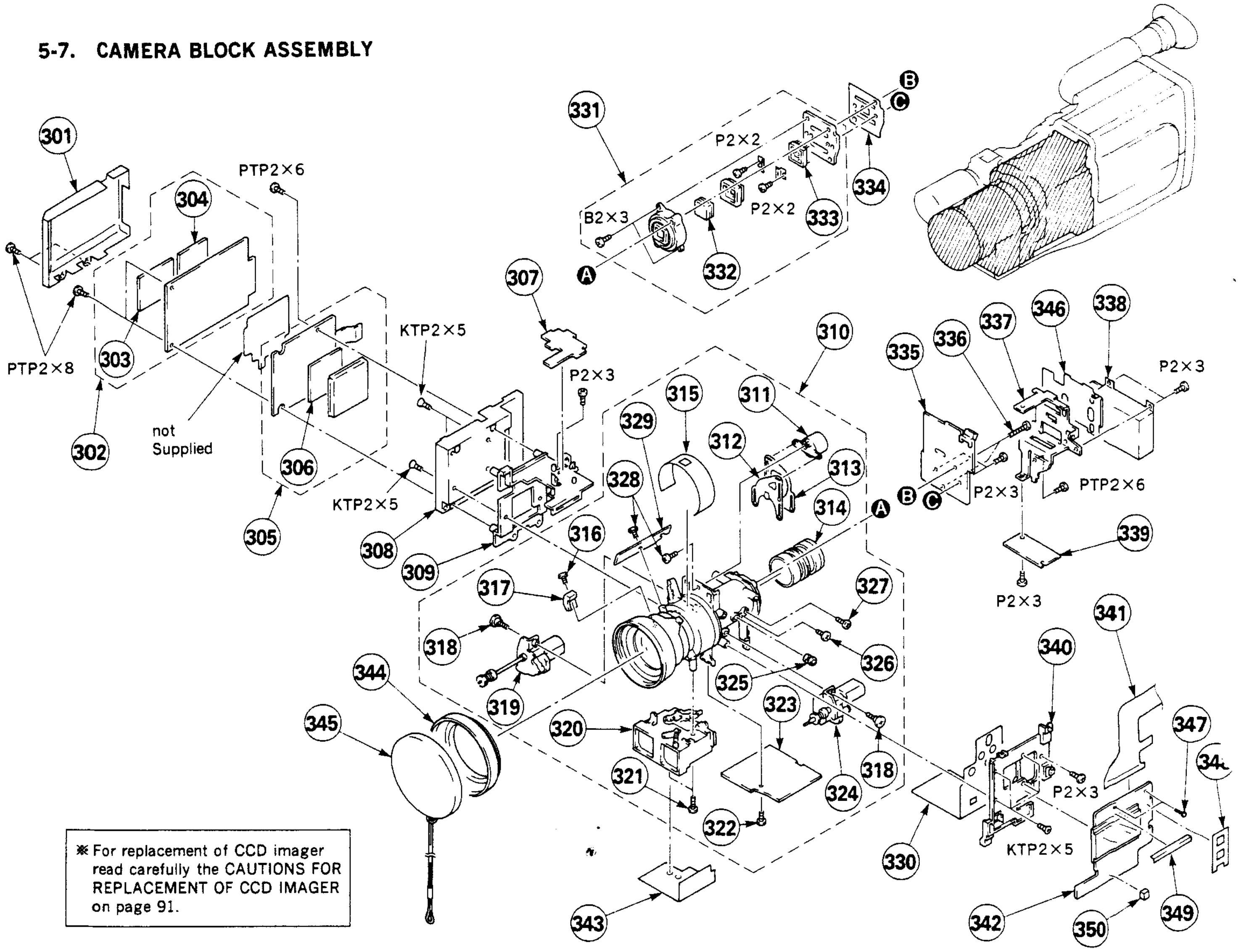
5-6. CHASSIS ASSEMBLY (2)


251
253
251
252
253
256
254
257
255
258
255
285
272
283
260
259
278
282
286
261
281
262
280
P1.7×4
279
263
278
P1.7×4
284
277
P1.7×2.5
264
P1.7×2.5
P1.4
×2.5
P1.7
×2.5
265
P2×5
267
266
P1.7×2.5
258
276
275
274
P1.7×2.5
273
268
not supplied
255
269
P1.7
×2.5
P1.7×2.5
270
271

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

No.	Part No.	Description	Remark
251	X-3712-029-1	ROLLER ASSY (2), GUIDE	
252	X-3712-030-1	BASE ASSY (2), TG5	
253	3-695-770-01	SCREW, GR LOCK	
254	3-695-545-01	JOINT, T	
255	3-321-393-01	WASHER, STOPPER	
256	X-3712-028-1	BASE ASSY (2), TG4	
257	X-3695-429-1	JOINT ASSY, S	
258	3-315-384-31	WASHER, STOPPER	
259	X-3695-414-1	SLIDER (T) ASSY, THREADING	
260	3-695-773-01	SPRING, TENSION	
261	3-695-544-01	ROLLER, GUIDE	
262	3-695-772-01	SPRING, TENSION	
263	X-3695-428-1	SLIDER (S) ASSY, THREADING	
264	X-3712-024-1	ARM ASSY (2), GEAR	
265	X-3712-020-1	BASE ASSY (2), MIDWAY PULLEY	
266	X-3712-021-1	PULLEY ASSY (2), MIDWAY	
267	3-712-163-01	SUPPORT (2), SLIDER	
268	1-535-574-11	TERMINAL, SHAFT GROUND	
269	X-3695-413-1	GEAR ASSY, CHANGE	
270	3-695-637-01	BELT, RELAY	
271	8-835-309-01	MOTOR, DC BHF-3301C (CAPSTAN) (M902)	
272	3-686-434-01	SCREW (2X5), BOLT WASHER	
273	3-695-627-01	STOPPER, SLIDER, S	
274	3-695-628-01	STOPPER, SLIDER, T	
275	3-695-677-01	SPRING (T), LEAF	
276	3-695-519-01	SCREW, FITTING, LEAF SPRING(T)	
277	3-695-532-01	SPRING, COMPRESSION	
278	3-695-727-01	RETAINER, FLANGE, UPPER	
279	3-695-794-01	FLANGE, LOWER, TG2	
280	3-695-530-01	SLEEVE, TG2	
281	3-712-164-01	ROLLER (2), TG2	
282	3-695-528-01	FLANGE, TG2	
283	3-695-529-01	NUT, TG2	
284	1-807-238-11	SENSOR, DEW CONDENSATION	
285	⚠.A-7048-177-A	DRUM ASSY (DGU-27B-R)	272, 286
286	A-7049-143-A	DRUM ASSY, UPPER (DGU-27-R)	

5-7. CAMERA BLOCK ASSEMBLY


301
302
303
304
305
306
307
308
309
310
311
312
313
314
315
316
317
318
319
320
321
322
323
324
325
326
327
328
329
330
331
332
333
334
335
336
337
338
339
340
341
342
343
344
345
346
347
34
349
350
PTP2×6
PTP2×8
KTP2×5
KTP2×5
KTP2×5
P2×2
P2×2
B2×3
P2×3
P2×3
P2×3
P2×3
P2×3
PTP2×6
not Supplied
A
A
B
B
C
C

※ For replacement of CCD imager read carefully the CAUTIONS FOR REPLACEMENT OF CCD IMAGER on page 91.

No.	Part No.	Description	Remark
301	*X-3724-551-1	CASE (B) ASSY, SHIELD, VC	
302	*A-7061-710-A	VC-63P BOARD, COMPLETE	303, 304
303	A-7068-128-A	MX-7 BOARD, COMPLETE (HIC)	
304	A-7068-129-A	PR-20 BOARD, COMPLETE (HIC)	
305	*A-7061-711-A	VC-62P BOARD, COMPLETE	306
306	A-7068-150-A	DT-73 BOARD, COMPLETE (HIC)	
307	*1-631-593-11	FD-12P BOARD	
308	*X-3724-550-1	CASE (A) ASSY, SHIELD, VC	
309	X-3726-501-1	FRAME (A) ASSY, CAMERA	
310	1-547-333-11	LENS, ZOOM (8508XA)	311-329
311	3-707-442-01	METER, IG (IRIS MOTOR)	
312	3-707-457-01	(B) ASSY, IRIS FEATHER	
313	3-707-458-01	FEATHER, IRIS (A)	
314	3-707-456-01	MIRROR TUBE UNIT, RELAY	
315	3-707-443-01	SHEET, ZOOM	
316	3-707-445-01	SCREW, (N) STOPPER CLAMP	
317	3-707-446-01	STOPPER, (N)	
318	3-707-447-01	SCREW, MOTOR CLAMP	
319	3-707-448-01	MOTOR UNIT, AF	
320	3-707-449-01	BLOCK UNIT, AF	
321	3-707-450-01	SCREW, AF BLOCK CLAMP	
322	3-707-459-01	SCREW, AF PC BOARD CLAMP	
323	3-707-629-01	PC BOARD UNIT, AF	
324	3-707-452-01	MOTOR UNIT, PZ	
325	3-707-453-01	ROLLER, ECCECTRIC	
326	3-707-454-01	SCREW	
327	3-707-455-01	SCREW, RELAY SET	
328	3-707-444-01	SCREW, IG METER CLAMP	
329	3-707-633-01	PC BOARD UNIT, SW	
330	*3-735-440-01	PLATE, SHIELD, AF	
331	A-7030-121-A	CCD ASSY	332, 333
332	A-7090-879-A	FILTER BLOCK, OPTICAL (OFB-02-01)	
333	8-752-603-56	IC ICX027BK-2 (CCD IMAGER)	
334	*3-725-180-01	SHEET, INSULATING, CCD HOLDER	
335	*A-7061-709-A	VC-61P BOARD, COMPLETE	
336	3-335-640-51	SCREW (M2X16)	
337	*3-735-428-01	JOINT	
338	1-464-993-11	CONVERTER, DC-DC	
339	*1-630-456-21	DC-21P BOARD	
340	X-3725-192-1	FRAME (B) ASSY, CAMERA	
341	1-626-233-11	FP-124 FLEXIBLE BOARD	
342	*A-7061-715-A	FC-25P BOARD, COMPLETE	
343	3-726-533-01	COVER, AF	
344	3-728-269-01	HOOD	
345	A-7090-806-A	CAP ASSY, HOOD	
346	*3-735-439-01	PLATE, SHIELD, VC-61	
347	*1-535-622-11	PIN, TERMINAL	
348	*3-735-467-01	SHEET, INSULATING, DDS	
349	*3-735-468-01	SHEET, INSULATING, LCD	
350	*3-735-470-01	SPACER, CAMERA	

SECTION 6
ELECTRICAL PARTS LIST

FP-53 **VF-13P**

NOTE:

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- If there are two or more same circuits in a set such as a stereophonic machine, only typical circuit parts may be indicated and capacitors and resistors in other same circuits may be omitted.

CAPACITORS:
MF: μF, PF: μμF.

RESISTORS
- All resistors are in ohms.
- F: nonflammable

COILS
- MMH: mH, UH: μH

SEMICONDUCTORS
In each case, U: μ, for example:
UA...: μA..., UPA...: μPA...,
UPC...: μPC, UPD...: μPD...

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description			Remark
	A-7060-693-A	FP-53 FLEXIBLE BOARD (Ref.No 3,000 Series) **********************			
	3-713-904-01	HOLDER (2), LED			
	8-719-948-22	SPI-315-25-BD			
		DIODE			
D302	8-719-940-81	DIODE GL452S			
D303	8-719-801-55	TLP-907-0			
D304	8-719-801-55	TLP-907-0			
		SWITCH			
S301	1-570-869-11	SWITCH, PUSH (2 KEY)			

****

Ref.No	Part No.	Description			Remark
	*A-7061-236-A	VF-13P BOARD, COMPLETE (Ref.No 5,000 Series) ************************			
	3-713-535-01	CUSHION, CRT			
	*3-725-155-01	INSULATOR, FB			
		CAPACITOR			
C901	1-126-369-11	ELECT	220MF	20%	6.3V
C902	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C904	1-127-486-11	ELECT(SOLID)	47MF	20%	6.3V
C905	1-163-009-11	CERAMIC CHIP	0.001MF	10%	50V
C906	1-163-115-00	CERAMIC CHIP	82PF	5%	50V
C907 ⚠.	1-162-625-11	CERAMIC CHIP	0.0047MF	5%	50V
C908 ⚠.	1-163-015-00	CERAMIC CHIP	0.0033MF	10%	50V
C909	1-126-193-11	ELECT CHIP	1MF	20%	50V
C911	1-131-388-00	TANTALUM	68MF	10%	3.15V
C912	1-102-038-00	CERAMIC	0.001MF		500V
C913	1-163-033-00	CERAMIC CHIP	0.022MF		50V
C915	1-126-193-11	ELECT CHIP	1MF	20%	50V
C916	1-163-037-11	CERAMIC CHIP	0.022MF	10%	25V
C917	1-135-166-21	TANTAL. CHIP	47MF	20%	6.3V
C918	1-162-638-11	CERAMIC CHIP	1MF		16V
C919	1-135-070-00	TANTAL. CHIP	0.1MF	10%	35V
C920	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V
		CONNECTOR			
CN901	*1-566-195-21	PIN, CONNECTOR (PC BOARD) 2P			
CN902	*1-566-195-11	PIN, CONNECTOR (PC BOARD) 2P			
		CONPOSITION CIRCUIT BLOCK			
CP901	1-238-119-11	RES, ADJ			
		SOCKET			
CRT901	1-526-978-21	SOCKET ASSY, CRT			
		DIODE			
D903	8-719-400-20	DIODE MA152WA			
		IC			
IC901	8-759-420-01	IC AN2512S			
		COIL			
L901	1-408-421-00	INDUCTOR	100UH		
L902	1-410-379-21	INDUCTOR CHIP	6.8UH		
L903 ⚠.	1-459-858-11	COIL, FERRITE (HLC)			
		TRANSISTOR			
Q903	8-729-106-64	TRANSISTOR 2SD1615-GL			
Q904	8-729-216-32	TRANSISTOR 2SA1163L			
		RESISTOR			
R902	1-216-051-00	METAL GLAZE	1.2K	5%	1/10W
R903	1-216-041-00	METAL GLAZE	470	5%	1/10W
R907	1-216-063-00	METAL GLAZE	3.9K	5%	1/10W
R908	1-216-063-00	METAL GLAZE	3.9K	5%	1/10W
R909	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W
R912	1-216-121-00	METAL GLAZE	1M	5%	1/10W
R913	1-216-123-11	METAL GLAZE	1.2M	5%	1/10W
R914	1-216-133-00	METAL GLAZE	3.3M	5%	1/10W
R915	1-216-133-00	METAL GLAZE	3.3M	5%	1/10W
R916	1-216-125-00	METAL GLAZE	1.5M	5%	1/10W
R917	1-216-121-00	METAL GLAZE	1M	5%	1/10W
R919	1-216-097-00	METAL GLAZE	100K	5%	1/10W
R920	1-216-113-00	METAL GLAZE	470K	5%	1/10W
R921	1-216-013-00	METAL GLAZE	33	5%	1/10W
R922	1-216-055-00	METAL GLAZE	1.8K	5%	1/10W
R923	1-216-025-00	METAL GLAZE	100	5%	1/10W
R924	1-216-306-11	METAL GLAZE	3.9	5%	1/10W
R925	1-216-336-11	METAL GLAZE	47K	1%	1/10W
R926	1-216-107-00	METAL GLAZE	270K	5%	1/10W
R928	1-216-870-11	METAL GLAZE	180K	1%	1/10W
R929	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W
R930	1-216-089-00	METAL GLAZE	47K	5%	1/10W
R931	1-216-121-00	METAL GLAZE	1M	5%	1/10W
		VARIABLE RESISTOR			
RV901	1-230-203-00	RES, ADJ, METAL GLAZE 2.2M			
		TRANSFORMER			
T901 ⚠.	1-439-428-11	TRANSFORMER ASSY, FLYBACK			
		THERMISTOR			
TH901	1-807-938-11	THERMISTOR			

****

Ref.No	Part No.	Description	Remark
	*A-7070-728-A	TL-18P BOARD, COMPLETE (Ref.No 5,000 Series) ************************	
		DIODE	
D950	8-719-941-34	DIODE GL1HD51	
		RESISTOR	
R950	1-216-037-00	METAL GLAZE 330 5% 1/10W	

****

Ref.No	Part No.	Description	Remark
	*A-7070-729-A	TL-19P BOARD, COMPLETE (Ref.No 5,000 Series) ************************	
		DIODE	
D955	8-719-941-34	DIODE GL1HD51	

****

Ref.No	Part No.	Description	Remark
	*A-7061-709-A	VC-61P BOARD, COMPLETE (Ref.No 1,000 Series) ************************	
	1-559-927-11	CABLE, FLAT (1.0MM PITCH) 33P	
	*3-735-421-01	HOLDER, WB SENSOR	
		CAPACITOR	
C600	1-135-092-21	TANTAL. CHIP 3.3MF 20% 16V	
C601	1-135-091-00	TANTAL. CHIP 1MF 20% 16V	
C602	1-135-092-21	TANTAL. CHIP 3.3MF 20% 16V	
C603	1-163-021-00	CERAMIC CHIP 0.01MF 10% 50V	
C604	1-135-079-21	TANTAL. CHIP 3.3MF 20% 25V	
C605	1-126-196-11	ELECT CHIP 3.3MF 20% 50V	
C606	1-126-400-11	ELECT CHIP 22MF 20% 35V	
C607	1-163-036-00	CERAMIC CHIP 0.068MF 50V	
C608	1-163-036-00	CERAMIC CHIP 0.068MF 50V	
C609	1-164-005-11	CERAMIC CHIP 0.47MF 25V	
C610	1-126-205-11	ELECT CHIP 47MF 20% 6.3V	
C611	1-162-638-11	CERAMIC CHIP 1MF 16V	
C612	1-163-014-00	CERAMIC CHIP 0.0027MF 10% 50V	
C850	1-130-467-00	MYLAR 470PF 5% 50V	
C851	1-130-481-00	MYLAR 0.0068MF 5% 50V	
C852	1-135-155-21	TANTAL. CHIP 4.7MF 20% 10V	
C853	1-163-038-00	CERAMIC CHIP 0.1MF 25V	
C854	1-124-779-00	ELECT CHIP 10MF 20% 16V	
C855	1-162-638-11	CERAMIC CHIP 1MF 16V	
C856	1-163-038-00	CERAMIC CHIP 0.1MF 25V	
C857	1-163-038-00	CERAMIC CHIP 0.1MF 25V	
C858	1-124-779-00	ELECT CHIP 10MF 20% 16V	
		CONNECTOR	
CN600	1-566-547-11	CONNECTOR, FPC (NON ZIF) 15P	
CN601	*1-566-758-11	PIN, CONNECTOR (PC BOARD) 3P	
CN850	*1-565-876-11	PIN, CONNECTOR (PC BOARD) 4P	

Ref.No	Part No.	Description	Remark
		DIODE	
D600	8-719-404-32	DIODE MA141WA	
D601	8-719-404-46	DIODE MA110	
D850	8-719-100-03	DIODE 1S2835	
		IC	
※IC600	8-752-603-56	IC ICX027BK-2 (CCD IMAGER)	
IC850	8-759-030-27	IC MC34182MR	
IC851	8-759-106-23	IC UPD4066BG	
IC852	8-759-012-75	IC MC146805F2FPSC82533	
IC853	8-759-100-93	IC UPC393G2	
		COIL	
L600	1-412-032-11	INDUCTOR CHIP 100UH	
L850	1-412-031-11	INDUCTOR CHIP 47UH	
		TRANSISTOR	
Q600	8-729-105-53	TRANSISTOR 2SK300-3	
Q601	8-729-421-23	TRANSISTOR XN1216	
Q602	8-729-905-35	TRANSISTOR 2SC4081-R	
Q850	8-729-403-06	TRANSISTOR XN1113	
Q851	8-729-403-06	TRANSISTOR XN1113	
Q852	8-729-805-69	TRANSISTOR 2SA1341	
Q855	8-729-403-07	TRANSISTOR XN1213	
Q856	8-729-403-07	TRANSISTOR XN1213	
Q868	8-729-805-45	TRANSISTOR 2SC3395	
Q869	8-729-403-07	TRANSISTOR XN1213	
		RESISTOR	
R600	1-216-045-00	METAL GLAZE 680 5% 1/10W	
R601	1-216-025-00	METAL GLAZE 100 5% 1/10W	
R602	1-216-063-00	METAL GLAZE 3.9K 5% 1/10W	
R603	1-216-091-00	METAL GLAZE 56K 5% 1/10W	
R604	1-216-083-00	METAL GLAZE 27K 5% 1/10W	
R605	1-216-107-00	METAL GLAZE 270K 5% 1/10W	
R606	1-216-748-11	METAL GLAZE 39K 5% 1/10W	
R607	1-216-077-00	METAL GLAZE 15K 5% 1/10W	
R608	1-216-077-00	METAL GLAZE 15K 5% 1/10W	
R609	1-216-121-00	METAL GLAZE 1M 5% 1/10W	
R610	1-216-025-00	METAL GLAZE 100 5% 1/10W	
R611	1-216-042-00	METAL GLAZE 510 5% 1/10W	
R613	1-216-081-00	METAL GLAZE 22K 5% 1/10W	
R850	1-216-049-00	METAL GLAZE 1K 5% 1/10W	
R851	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R852	1-216-085-00	METAL GLAZE 33K 5% 1/10W	
R853	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R855	1-216-077-00	METAL GLAZE 15K 5% 1/10W	
R856	1-216-079-00	METAL GLAZE 18K 5% 1/10W	
R857	1-216-065-00	METAL GLAZE 4.7K 5% 1/10W	
R858	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R860	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R861	1-216-097-00	METAL GLAZE 100K 5% 1/10W	
R862	1-216-073-00	METAL GLAZE 10K 5% 1/10W	

※For replacement of CCD imager read carefully the CAUTIONS FOR REPLACEMENT OF CCD IMAGER on page 91.

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description		Remark
R863	1-216-121-00	METAL GLAZE 1M	5%	1/10W
R864	1-216-115-00	METAL GLAZE 560K	5%	1/10W
R865	1-216-107-00	METAL GLAZE 270K	5%	1/10W
R866	1-216-101-00	METAL GLAZE 150K	5%	1/10W
R867	1-216-093-00	METAL GLAZE 68K	5%	1/10W
R868	1-216-093-00	METAL GLAZE 68K	5%	1/10W
R869	1-216-115-00	METAL GLAZE 560K	5%	1/10W
R870	1-216-107-00	METAL GLAZE 270K	5%	1/10W
R871	1-216-101-00	METAL GLAZE 150K	5%	1/10W
R872	1-216-093-00	METAL GLAZE 68K	5%	1/10W
R873	1-216-093-00	METAL GLAZE 68K	5%	1/10W
R882	1-216-067-00	METAL GLAZE 5.6K	5%	1/10W
R883	1-216-073-00	METAL GLAZE 10K	5%	1/10W
R884	1-216-093-00	METAL GLAZE 68K	5%	1/10W
R885	1-216-093-00	METAL GLAZE 68K	5%	1/10W

VARIABLE RESISTOR

RV600	1-230-873-11	RES, ADJ, METAL GLAZE 47K		
RV850	1-230-870-11	RES, ADJ, METAL GLAZE 10K		

BALANCE SENSOR

S8850	1-807-684-11	SENSOR, WHITE BALANCE		

CRYSTAL

X850	1-577-082-11	VIBRATOR, CERAMIC		

****

*A-7061-711-A VC-62P BOARD, COMPLETE (Ref.No 1,000 Series)
****

A-7068-150-A DT-73 BOARD, COMPLETE (HIC)

CAPACITOR

Ref.No	Part No.	Description		Remark
C620	1-163-145-00	CERAMIC CHIP 0.0015MF	10%	50V
C621	1-163-145-00	CERAMIC CHIP 0.0015MF	10%	50V
C623	1-163-145-00	CERAMIC CHIP 0.0015MF	10%	50V
C624	1-162-637-11	CERAMIC CHIP 0.47MF		16V
C625	1-163-021-00	CERAMIC CHIP 0.01MF	10%	50V
C629	1-135-145-11	TANTAL. CHIP 0.47MF	20%	35V
C630	1-126-204-11	ELECT CHIP 47MF	20%	16V
C631	1-163-021-00	CERAMIC CHIP 0.01MF		50V
C632	1-163-021-00	CERAMIC CHIP 0.01MF	10%	50V
C633	1-124-778-00	ELECT CHIP 22MF	20%	6.3V
C634	1-163-021-00	CERAMIC CHIP 0.01MF	10%	50V
C635	1-124-778-00	ELECT CHIP 22MF	20%	6.3V
C636	1-163-021-00	CERAMIC CHIP 0.01MF	10%	50V
C637	1-163-133-00	CERAMIC CHIP 470PF	10%	50V
C638	1-163-133-00	CERAMIC CHIP 470PF	10%	50V
C639	1-163-133-00	CERAMIC CHIP 470PF	10%	50V
C641	1-163-021-00	CERAMIC CHIP 0.01MF	10%	50V
C643	1-163-021-00	CERAMIC CHIP 0.01MF	10%	50V
C644	1-124-779-00	ELECT CHIP 10MF	20%	16V
C645	1-163-021-00	CERAMIC CHIP 0.01MF	10%	50V
C646	1-135-162-21	TANTAL. CHIP 33MF	20%	6.3V
C647	1-163-036-00	CERAMIC CHIP 0.068MF		50V
C648	1-126-400-11	ELECT CHIP 22MF	20%	35V
C649	1-163-036-00	CERAMIC CHIP 0.068MF		50V
C652	1-163-021-00	CERAMIC CHIP 0.01MF	10%	50V
C653	1-163-009-11	CERAMIC CHIP 0.001MF	10%	50V
C654	1-163-101-00	CERAMIC CHIP 22PF	5%	50V
C655	1-163-109-00	CERAMIC CHIP 47PF	5%	50V
C656	1-163-109-00	CERAMIC CHIP 47PF	5%	50V
C658	1-163-009-11	CERAMIC CHIP 0.001MF	10%	50V
C659	1-163-109-00	CERAMIC CHIP 47PF	5%	50V
C660	1-163-021-00	CERAMIC CHIP 0.01MF	10%	50V
C661	1-135-161-21	TANTAL. CHIP 22MF	20%	10V
C665	1-163-009-11	CERAMIC CHIP 0.001MF	10%	50V
C666	1-163-021-00	CERAMIC CHIP 0.01MF	10%	50V
C667	1-163-009-11	CERAMIC CHIP 0.001MF	10%	50V
C668	1-163-101-00	CERAMIC CHIP 22PF	5%	50V
C669	1-163-021-00	CERAMIC CHIP 0.01MF	10%	50V
C670	1-163-809-11	CERAMIC CHIP 0.047MF	10%	25V
C673	1-135-091-00	TANTAL. CHIP 1MF	20%	16V
C675	1-163-021-00	CERAMIC CHIP 0.01MF	10%	50V
C676	1-163-021-00	CERAMIC CHIP 0.01MF	10%	50V
C677	1-163-133-00	CERAMIC CHIP 470PF	10%	50V
C678	1-163-133-00	CERAMIC CHIP 470PF	10%	50V
C679	1-163-133-00	CERAMIC CHIP 470PF	10%	50V
C680	1-163-133-00	CERAMIC CHIP 470PF	10%	50V
C681	1-163-133-00	CERAMIC CHIP 470PF	10%	50V
C682	1-163-133-00	CERAMIC CHIP 470PF	10%	50V
C687	1-163-021-00	CERAMIC CHIP 0.01MF	10%	50V
C688	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V

CONNECTOR

CN620	*1-565-876-11	PIN, CONNECTOR (PC BOARD) 4P		
CN622	*1-506-743-11	PIN, CONNECTOR 5P		
CN623	1-565-527-11	PIN, CONNECTOR (PC BOARD) 2P		

TRIMMER

CT620	1-141-331-11	CAP, VAR, TRIMMER (CHIP)		

DIODE

D623	8-719-100-05	DIODE 1S2837		
D624	8-719-100-05	DIODE 1S2837		
D625	8-713-220-00	DIODE 1T32-2		
D626	8-719-100-05	DIODE 1S2837		

IC

IC620	8-759-981-82	IC RC3414M		
IC621	8-752-326-08	IC CXD1159Q		

COIL

L622	1-412-029-11	INDUCTOR CHIP 10UH		

When indicating parts by reference number, please include the board name.

VC-62P

Ref.No	Part No.	Description	Remark
L623	1-412-029-11	INDUCTOR CHIP 10UH	
L624	1-412-034-21	INDUCTOR CHIP 330UH	
L625	1-412-032-11	INDUCTOR CHIP 100UH	
L626	1-410-204-31	INDUCTOR CHIP 10UH	
L628	1-410-192-51	INDUCTOR CHIP 1UH	
L629	1-412-026-11	INDUCTOR CHIP 1UH	
L630	1-410-180-51	INDUCTOR CHIP 0.1UH	
L631	1-410-180-51	INDUCTOR CHIP 0.1UH	
		TRANSISTOR	
Q620	8-729-905-35	TRANSISTOR 2SC4081-R	
Q621	8-729-905-23	TRANSISTOR 2SA1576-R	
Q622	8-729-905-35	TRANSISTOR 2SC4081-R	
Q623	8-729-905-23	TRANSISTOR 2SA1576-R	
Q624	8-729-905-23	TRANSISTOR 2SA1576-R	
Q625	8-729-905-35	TRANSISTOR 2SC4081-R	
Q626	8-729-403-07	TRANSISTOR XN1213	
Q627	8-729-905-35	TRANSISTOR 2SC4081-R	
Q628	8-729-905-23	TRANSISTOR 2SA1576-R	
Q629	8-729-809-88	TRANSISTOR 2SA1416	
Q630	8-729-810-01	TRANSISTOR 2SC3646	
Q631	8-729-905-35	TRANSISTOR 2SC4081-R	
Q632	8-729-905-23	TRANSISTOR 2SA1576-R	
Q633	8-729-905-23	TRANSISTOR 2SA1576-R	
Q634	8-729-100-66	TRANSISTOR 2SC1623	
		RESISTOR	
R622	1-216-121-00	METAL GLAZE 1M 5% 1/10W	
R624	1-216-077-00	METAL GLAZE 15K 5% 1/10W	
R625	1-216-013-00	METAL GLAZE 33 5% 1/10W	
R626	1-216-059-00	METAL GLAZE 2.7K 5% 1/10W	
R627	1-216-059-00	METAL GLAZE 2.7K 5% 1/10W	
R633	1-216-057-00	METAL GLAZE 2.2K 5% 1/10W	
R634	1-216-071-00	METAL GLAZE 8.2K 5% 1/10W	
R635	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R636	1-216-067-00	METAL GLAZE 5.6K 5% 1/10W	
R637	1-216-051-00	METAL GLAZE 1.2K 5% 1/10W	
R638	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R640	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R641	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R642	1-216-079-00	METAL GLAZE 18K 5% 1/10W	
R643	1-216-084-00	METAL GLAZE 30K 5% 1/10W	
R644	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R645	1-216-047-00	METAL GLAZE 820 5% 1/10W	
R647	1-216-077-00	METAL GLAZE 15K 5% 1/10W	
R648	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R649	1-216-081-00	METAL GLAZE 22K 5% 1/10W	
R650	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R651	1-216-071-00	METAL GLAZE 8.2K 5% 1/10W	
R652	1-216-103-00	METAL GLAZE 180K 5% 1/10W	
R653	1-216-083-00	METAL GLAZE 27K 5% 1/10W	
R654	1-216-103-00	METAL GLAZE 180K 5% 1/10W	
R655	1-216-025-00	METAL GLAZE 100 5% 1/10W	

Ref.No	Part No.	Description	Remark
R656	1-216-065-00	METAL GLAZE 4.7K 5% 1/10W	
R657	1-216-065-00	METAL GLAZE 4.7K 5% 1/10W	
R658	1-216-295-00	METAL GLAZE 0 5% 1/10W	
R660	1-216-085-00	METAL GLAZE 33K 5% 1/10W	
R661	1-216-077-00	METAL GLAZE 15K 5% 1/10W	
R667	1-216-005-00	METAL GLAZE 15 5% 1/10W	
R668	1-216-005-00	METAL GLAZE 15 5% 1/10W	
R669	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R670	1-216-085-00	METAL GLAZE 33K 5% 1/10W	
R671	1-216-081-00	METAL GLAZE 22K 5% 1/10W	
R674	1-216-057-00	METAL GLAZE 2.2K 5% 1/10W	
R675	1-216-057-00	METAL GLAZE 2.2K 5% 1/10W	
R676	1-216-295-00	METAL GLAZE 0 5% 1/10W	
R678	1-216-025-00	METAL GLAZE 100 5% 1/10W	
R679	1-216-047-00	METAL GLAZE 820 5% 1/10W	
R680	1-216-057-00	METAL GLAZE 2.2K 5% 1/10W	
R681	1-216-057-00	METAL GLAZE 2.2K 5% 1/10W	
R683	1-216-295-00	METAL GLAZE 0 5% 1/10W	
R684	1-216-025-00	METAL GLAZE 100 5% 1/10W	
R685	1-216-093-00	METAL GLAZE 68K 5% 1/10W	
R686	1-216-121-00	METAL GLAZE 1M 5% 1/10W	
R687	1-216-049-00	METAL GLAZE 1K 5% 1/10W	
R688	1-216-097-00	METAL GLAZE 100K 5% 1/10W	
R689	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R690	1-216-025-00	METAL GLAZE 100 5% 1/10W	
R691	1-216-049-00	METAL GLAZE 1K 5% 1/10W	
R692	1-216-057-00	METAL GLAZE 2.2K 5% 1/10W	
R696	1-216-295-00	METAL GLAZE 0 5% 1/10W	
R697	1-216-089-00	METAL GLAZE 47K 5% 1/10W	
R698	1-216-057-00	METAL GLAZE 2.2K 5% 1/10W	
R699	1-216-057-00	METAL GLAZE 2.2K 5% 1/10W	
		VARIABLE RESISTOR	
RV620	1-230-873-11	RES, ADJ, METAL GLAZE 47K	
RV621	1-230-869-11	RES, ADJ, METAL GLAZE 4.7K	
RV622	1-230-869-11	RES, ADJ, METAL GLAZE 4.7K	
		CONNECTOR	
W620	1-574-082-11	CABLE, FLAT (1.0MM PITCH) 15P	
		CRYSTAL	
X620	1-577-119-11	OSCILLATOR, CRYSTAL	
X621	1-567-733-11	VIBRATOR, CRYSTAL	

****

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description	Remark
	*A-7061-710-A	VC-63P BOARD, COMPLETE (Ref.No ************************	1,000 Series)
	A-7068-128-A	MX-7 BOARD, COMPLETE (HIC)	
	A-7068-129-A	PR-20 BOARD, COMPLETE (HIC)	

CAPACITOR

Ref.No	Part No.	Description		Remark
C701	1-163-021-00	CERAMIC CHIP 0.01MF	10%	50V
C702	1-163-021-00	CERAMIC CHIP 0.01MF	10%	50V
C703	1-124-778-00	ELECT CHIP 22MF	20%	6.3V
C704	1-124-778-00	ELECT CHIP 22MF	20%	6.3V
C705	1-163-021-00	CERAMIC CHIP 0.01MF	10%	50V
C706	1-126-206-11	ELECT CHIP 100MF	20%	6.3V
C707	1-163-038-00	CERAMIC CHIP 0.1MF		25V
C708	1-163-038-00	CERAMIC CHIP 0.1MF		25V
C709	1-163-111-00	CERAMIC CHIP 56PF	5%	50V
C712	1-162-638-11	CERAMIC CHIP 1MF		16V
C715	1-135-091-00	TANTAL. CHIP 1MF	20%	16V
C716	1-135-091-00	TANTAL. CHIP 1MF	20%	16V
C718	1-163-038-00	CERAMIC CHIP 0.1MF		25V
C719	1-135-091-00	TANTAL. CHIP 1MF	20%	16V
C720	1-163-038-00	CERAMIC CHIP 0.1MF		25V
C721	1-163-093-00	CERAMIC CHIP 10PF	5%	50V
C722	1-164-005-11	CERAMIC CHIP 0.47MF		25V
C723	1-163-038-00	CERAMIC CHIP 0.1MF		25V
C724	1-164-005-11	CERAMIC CHIP 0.47MF		25V
C725	1-163-093-00	CERAMIC CHIP 10PF	5%	50V
C726	1-163-038-00	CERAMIC CHIP 0.1MF		25V
C727	1-163-117-00	CERAMIC CHIP 100PF	5%	50V
C729	1-126-198-11	ELECT CHIP 4.7MF	20%	35V
C730	1-163-021-00	CERAMIC CHIP 0.01MF	10%	50V
C731	1-163-021-00	CERAMIC CHIP 0.01MF	10%	50V
C732	1-124-566-11	ELECT 120MF	20%	6.3V
C733	1-163-038-00	CERAMIC CHIP 0.1MF		25V
C734	1-163-038-00	CERAMIC CHIP 0.1MF		25V
C736	1-163-038-00	CERAMIC CHIP 0.1MF		25V
C737	1-163-115-00	CERAMIC CHIP 82PF	5%	50V
C738	1-163-125-00	CERAMIC CHIP 220PF	5%	50V
C739	1-163-095-00	CERAMIC CHIP 12PF	5%	50V
C740	1-163-021-00	CERAMIC CHIP 0.01MF	10%	50V
C741	1-163-021-00	CERAMIC CHIP 0.01MF	10%	50V
C742	1-124-778-00	ELECT CHIP 22MF	20%	6.3V
C743	1-124-778-00	ELECT CHIP 22MF	20%	6.3V
C744	1-163-109-00	CERAMIC CHIP 47PF	5%	50V
C745	1-163-109-00	CERAMIC CHIP 47PF	5%	50V
C746	1-163-097-00	CERAMIC CHIP 15PF	5%	50V
C747	1-163-095-00	CERAMIC CHIP 12PF	5%	50V
C748	1-135-091-00	TANTAL. CHIP 1MF	20%	16V
C749	1-163-038-00	CERAMIC CHIP 0.1MF		25V
C750	1-163-038-00	CERAMIC CHIP 0.1MF		25V
C753	1-163-133-00	CERAMIC CHIP 470PF	5%	50V
C754	1-163-145-00	CERAMIC CHIP 0.0015MF	10%	50V
C755	1-163-145-00	CERAMIC CHIP 0.0015MF	10%	50V
C756	1-163-145-00	CERAMIC CHIP 0.0015MF	10%	50V
C757	1-163-101-00	CERAMIC CHIP 22PF	5%	50V

CONNECTOR

Ref.No	Part No.	Description
CN702	1-565-877-11	PIN, CONNECTOR (PC BOARD) 5P
CN703	1-566-547-11	CONNECTOR, FPC (NON ZIF) 15P
CN704	1-565-879-11	PIN, CONNECTOR (PC BOARD) 7P
CN705	1-565-880-11	PIN, CONNECTOR (PC BOARD) 8P

FILTER

Ref.No	Part No.	Description
FL701	1-236-266-11	FILTER, LOW PASS (YH)
FL702	1-236-267-11	FILTER, LOW PASS (YDL)
FL704	1-236-192-11	FILTER, LOW PASS
FL706	1-415-669-21	DL (LC)
FL707	1-236-265-11	FILTER, BAND PASS

IC

Ref.No	Part No.	Description
IC701	8-752-033-34	IC CXA1072R

COIL

Ref.No	Part No.	Description
L701	1-412-031-11	INDUCTOR CHIP 47UH
L702	1-412-031-11	INDUCTOR CHIP 47UH
L703	1-410-204-31	INDUCTOR CHIP 10UH
L704	1-410-657-21	INDUCTOR CHIP 180UH

TRANSISTOR

Ref.No	Part No.	Description
Q701	8-729-905-23	TRANSISTOR 2SA1576-R
Q702	8-729-905-35	TRANSISTOR 2SC4081-R
Q705	8-729-905-23	TRANSISTOR 2SA1576-R
Q706	8-729-905-35	TRANSISTOR 2SC4081-R
Q707	8-729-905-23	TRANSISTOR 2SA1576-R
Q708	8-729-905-35	TRANSISTOR 2SC4081-R
Q709	8-729-402-78	TRANSISTOR XN6401
Q710	8-729-905-23	TRANSISTOR 2SA1576-R
Q711	8-729-905-35	TRANSISTOR 2SC4081-R
Q712	8-729-905-35	TRANSISTOR 2SC4081-R

RESISTOR

Ref.No	Part No.	Description			Remark
R701	1-216-049-00	METAL GLAZE	1K	5%	1/10W
R702	1-216-047-00	METAL GLAZE	820	5%	1/10W
R703	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W
R704	1-216-049-00	METAL GLAZE	1K	5%	1/10W
R705	1-216-049-00	METAL GLAZE	1K	5%	1/10W
R706	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W
R707	1-216-748-11	METAL GLAZE	39K	5%	1/10W
R708	1-216-085-00	METAL GLAZE	33K	5%	1/10W
R709	1-216-085-00	METAL GLAZE	33K	5%	1/10W
R710	1-216-748-11	METAL GLAZE	39K	5%	1/10W
R711	1-216-075-00	METAL GLAZE	12K	5%	1/10W
R712	1-216-079-00	METAL GLAZE	18K	5%	1/10W
R713	1-216-748-11	METAL GLAZE	39K	5%	1/10W
R714	1-216-748-11	METAL GLAZE	39K	5%	1/10W
R715	1-216-079-00	METAL GLAZE	18K	5%	1/10W

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description				Remark
R716	1-216-079-00	METAL GLAZE	18K	5%	1/10W	
R717	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R718	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R719	1-216-675-11	METAL CHIP	10K	0.50%	1/10W	
R720	1-216-677-11	METAL CHIP	12K	0.50%	1/10W	
R721	1-216-053-00	METAL GLAZE	1.5K	5%	1/10W	
R722	1-216-095-00	METAL GLAZE	82K	5%	1/10W	
R723	1-216-095-00	METAL GLAZE	82K	5%	1/10W	
R724	1-216-099-00	METAL GLAZE	120K	5%	1/10W	
R725	1-216-081-00	METAL GLAZE	22K	5%	1/10W	
R727	1-216-748-11	METAL GLAZE	39K	5%	1/10W	
R728	1-216-091-00	METAL GLAZE	56K	5%	1/10W	
R729	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R730	1-216-748-11	METAL GLAZE	39K	5%	1/10W	
R731	1-216-055-00	METAL GLAZE	1.8K	5%	1/10W	
R732	1-216-067-00	METAL GLAZE	5.6K	5%	1/10W	
R733	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R734	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R735	1-216-748-11	METAL GLAZE	39K	5%	1/10W	
R736	1-216-748-11	METAL GLAZE	39K	5%	1/10W	
R737	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R738	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R739	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R740	1-216-077-00	METAL GLAZE	15K	5%	1/10W	
R741	1-216-080-00	METAL GLAZE	20K	5%	1/10W	
R742	1-216-748-11	METAL GLAZE	39K	5%	1/10W	
R743	1-216-081-00	METAL GLAZE	22K	5%	1/10W	
R744	1-216-295-00	METAL GLAZE	0	5%	1/10W	
R747	1-216-075-00	METAL GLAZE	12K	5%	1/10W	
R748	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R749	1-216-077-00	METAL GLAZE	15K	5%	1/10W	
R750	1-216-071-00	METAL GLAZE	8.2K	5%	1/10W	
R751	1-216-748-11	METAL GLAZE	39K	5%	1/10W	
R752	1-216-085-00	METAL GLAZE	33K	5%	1/10W	
R753	1-216-748-11	METAL GLAZE	39K	5%	1/10W	
R754	1-216-082-00	METAL GLAZE	24K	5%	1/10W	
R755	1-216-075-00	METAL GLAZE	12K	5%	1/10W	
R756	1-216-063-00	METAL GLAZE	3.9K	5%	1/10W	
R757	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R758	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R759	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R760	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R761	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R764	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W	
R765	1-216-081-00	METAL GLAZE	22K	5%	1/10W	
R766	1-216-081-00	METAL GLAZE	22K	5%	1/10W	
R767	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R768	1-216-079-00	METAL GLAZE	18K	5%	1/10W	
R769	1-216-076-00	METAL GLAZE	13K	5%	1/10W	
R770	1-216-075-00	METAL GLAZE	12K	5%	1/10W	
R771	1-216-077-00	METAL GLAZE	15K	5%	1/10W	
R774	1-216-295-00	METAL GLAZE	0	5%	1/10W	
R776	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	

Ref.No	Part No.	Description				Remark
R777	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	
R778	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	
R779	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	
R780	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R781	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R782	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R783	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R784	1-216-081-00	METAL GLAZE	22K	5%	1/10W	
R786	1-216-295-00	METAL GLAZE	0	5%	1/10W	
R787	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R788	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R789	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R790	1-216-072-00	METAL GLAZE	9.1K	5%	1/10W	
R791	1-216-051-00	METAL GLAZE	1.2K	5%	1/10W	
R792	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R793	1-216-081-00	METAL GLAZE	22K	5%	1/10W	
R794	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R795	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	
R796	1-216-041-00	METAL GLAZE	470	5%	1/10W	
R797	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	
R798	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R799	1-216-295-00	METAL GLAZE	0	5%	1/10W	
R801	1-216-079-00	METAL GLAZE	18K	5%	1/10W	
R802	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	
R805	1-216-081-00	METAL GLAZE	22K	5%	1/10W	
R806	1-216-067-00	METAL GLAZE	5.6K	5%	1/10W	
R809	1-216-298-00	METAL GLAZE	2.2	5%	1/10W	
R810	1-216-085-00	METAL GLAZE	33K	5%	1/10W	
R812	1-216-079-00	METAL GLAZE	18K	5%	1/10W	
R814	1-216-091-00	METAL GLAZE	56K	5%	1/10W	
R816	1-216-063-00	METAL GLAZE	3.9K	5%	1/10W	
R819	1-216-079-00	METAL GLAZE	18K	5%	1/10W	
R820	1-216-031-00	METAL GLAZE	180	5%	1/10W	
R821	1-216-033-00	METAL GLAZE	220	5%	1/10W	
R822	1-216-033-00	METAL GLAZE	220	5%	1/10W	
R823	1-216-115-00	METAL GLAZE	560K	5%	1/10W	
R824	1-216-121-00	METAL GLAZE	1M	5%	1/10W	

VARIABLE RESISTOR

Ref.No	Part No.	Description		Remark
RV701	1-230-873-11	RES, ADJ, METAL GLAZE	47K	
RV705	1-230-873-11	RES, ADJ, METAL GLAZE	47K	
RV706	1-230-873-11	RES, ADJ, METAL GLAZE	47K	
RV707	1-230-873-11	RES, ADJ, METAL GLAZE	47K	
RV708	1-230-873-11	RES, ADJ, METAL GLAZE	47K	
RV709	1-230-873-11	RES, ADJ, METAL GLAZE	47K	
RV710	1-230-873-11	RES, ADJ, METAL GLAZE	47K	
RV711	1-230-873-11	RES, ADJ, METAL GLAZE	47K	
RV712	1-230-873-11	RES, ADJ, METAL GLAZE	47K	
RV713	1-230-873-11	RES, ADJ, METAL GLAZE	47K	
RV714	1-230-873-11	RES, ADJ, METAL GLAZE	47K	
RV715	1-230-873-11	RES, ADJ, METAL GLAZE	47K	
RV716	1-230-873-11	RES, ADJ, METAL GLAZE	47K	
RV717	1-230-873-11	RES, ADJ, METAL GLAZE	47K	

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description	Remark
RV718	1-230-873-11	RES, ADJ, METAL GLAZE 47K	
RV719	1-230-873-11	RES, ADJ, METAL GLAZE 47K	
RV720	1-230-873-11	RES, ADJ, METAL GLAZE 47K	
RV721	1-230-873-11	RES, ADJ, METAL GLAZE 47K	
RV722	1-230-873-11	RES, ADJ, METAL GLAZE 47K	
RV724	1-230-868-11	RES, ADJ, METAL GLAZE 2.2K	
RV725	1-230-871-11	RES, ADJ, METAL GLAZE 22K	
RV726	1-230-870-11	RES, ADJ, METAL GLAZE 10K	

****

*A-7061-714-A SS-93P BOARD, COMPLETE (Ref.No 2,000 Series)
****

*3-718-223-01 HOLDER, TE
*3-725-136-01 REINFORCEMENT, VA-SS
*3-730-889-01 HOLDER, TOP

CAPACITOR

Ref.No	Part No.	Description			Remark
C001	1-126-204-11	ELECT CHIP	47MF	20%	16V
C002	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C003	1-163-105-00	CERAMIC CHIP	33PF	5%	50V
C004	1-126-198-11	ELECT CHIP	4.7MF	20%	35V
C006	1-124-779-00	ELECT CHIP	10MF	20%	16V
C007	1-124-779-00	ELECT CHIP	10MF	20%	16V
C008	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C009	1-126-206-11	ELECT CHIP	100MF	20%	6.3V
C010	1-162-638-11	CERAMIC CHIP	1MF		16V
C011	1-162-638-11	CERAMIC CHIP	1MF		16V
C012	1-124-778-00	ELECT CHIP	22MF	20%	6.3V
C014	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C015	1-163-034-00	CERAMIC CHIP	0.033MF		50V
C017	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C051	1-163-077-00	CERAMIC CHIP	0.1MF	10%	25V
C052	1-163-077-00	CERAMIC CHIP	0.1MF	10%	25V
C053	1-163-077-00	CERAMIC CHIP	0.1MF	10%	25V
C054	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C055	1-124-577-11	ELECT	82MF	20%	10V
C056	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C057	1-124-577-11	ELECT	82MF	20%	10V
C058	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C059	1-124-577-11	ELECT	82MF	20%	10V
C060	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C061	1-126-204-11	ELECT CHIP	47MF	20%	16V
C062	1-162-638-11	CERAMIC CHIP	1MF		16V
C063	1-135-149-21	TANTAL. CHIP	2.2MF	20%	6.3V
C064	1-135-091-00	TANTAL. CHIP	1MF	20%	16V
C066	1-162-638-11	CERAMIC CHIP	1MF		16V
C068	1-126-196-11	ELECT CHIP	3.3MF	20%	50V
C069	1-124-779-00	ELECT CHIP	10MF	20%	16V
C070	1-135-091-00	TANTAL. CHIP	1MF	20%	16V
C071	1-124-779-00	ELECT CHIP	10MF	20%	16V
C072	1-135-091-00	TANTAL. CHIP	1MF	20%	16V
C073	1-135-091-00	TANTAL. CHIP	1MF	20%	16V
C074	1-124-779-00	ELECT CHIP	10MF	20%	16V
C075	1-124-779-00	ELECT CHIP	10MF	20%	16V
C076	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C084	1-163-033-00	CERAMIC CHIP	0.022MF		50V
C085	1-163-021-00	CERAMIC CHIP	0.01MF		50V
C086	1-136-017-00	CERAMIC CHIP	0.0047MF		50V
C087	1-164-004-11	CERAMIC CHIP	0.1MF	10%	25V
C088	1-163-101-00	CERAMIC CHIP	22PF	5%	50V
C089	1-163-101-00	CERAMIC CHIP	22PF	5%	50V
C200	1-124-779-00	ELECT CHIP	10MF	20%	16V
C201	1-163-035-00	CERAMIC CHIP	0.047MF		50V
C202	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C204	1-124-778-00	ELECT CHIP	22MF	20%	6.3V
C205	1-163-035-00	CERAMIC CHIP	0.047MF		50V
C206	1-124-779-00	ELECT CHIP	10MF	20%	16V
C207	1-163-035-00	CERAMIC CHIP	0.047MF		50V
C209	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V
C210	1-163-009-11	CERAMIC CHIP	0.001MF	10%	50V
C211	1-163-035-00	CERAMIC CHIP	0.047MF		50V
C212	1-124-779-00	ELECT CHIP	10MF	20%	16V
C213	1-124-778-00	ELECT CHIP	22MF	20%	6.3V
C215	1-135-145-11	TANTAL. CHIP	0.47MF	20%	25V
C216	1-163-059-00	CERAMIC CHIP	0.01MF	10%	50V
C217	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C218	1-163-089-00	CERAMIC CHIP	6PF	0.5PF	50V
C301	1-163-117-00	CERAMIC CHIP	100PF	5%	50V
C302	1-163-121-00	CERAMIC CHIP	150PF	5%	50V
C303	1-163-117-00	CERAMIC CHIP	100PF	5%	50V
C304	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C305	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C306	1-163-117-00	CERAMIC CHIP	100PF	5%	50V
C308	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V
C309	1-163-809-11	CERAMIC CHIP	0.047MF	10%	25V
C310	1-163-809-11	CERAMIC CHIP	0.047MF	10%	25V
C311	1-164-004-11	CERAMIC CHIP	0.1MF	10%	25V
C312	1-163-809-11	CERAMIC CHIP	0.047MF	10%	25V
C313	1-163-077-00	CERAMIC CHIP	0.1MF	10%	25V
C314	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V
C315	1-163-809-11	CERAMIC CHIP	0.047MF	10%	25V
C316	1-163-809-11	CERAMIC CHIP	0.047MF	10%	25V
C317	1-124-778-00	ELECT CHIP	22MF	20%	6.3V
C318	1-163-809-11	CERAMIC CHIP	0.047MF	10%	25V
C319	1-163-137-00	CERAMIC CHIP	680PF	5%	50V
C320	1-124-778-00	ELECT CHIP	22MF	20%	6.3V
C321	1-163-809-11	CERAMIC CHIP	0.047MF	10%	25V
C322	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V
C323	1-164-004-11	CERAMIC CHIP	0.1MF	10%	25V
C324	1-163-809-11	CERAMIC CHIP	0.047MF	10%	25V
C325	1-164-161-11	CERAMIC CHIP	0.0022MF	10%	50V
C326	1-164-004-11	CERAMIC CHIP	0.1MF	10%	25V
C327	1-164-004-11	CERAMIC CHIP	0.1MF	10%	25V
C328	1-163-809-11	CERAMIC CHIP	0.047MF	10%	25V
C329	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V

When indicating parts by reference number, please include the board name.

SS-93P

Ref.No	Part No.	Description		Remark
C330	1-124-778-00	ELECT CHIP 22MF	20%	6.3V
C332	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C333	1-163-809-11	CERAMIC CHIP 0.047MF	10%	25V
C334	1-163-809-11	CERAMIC CHIP 0.047MF	10%	25V
C335	1-124-778-00	ELECT CHIP 22MF	20%	6.3V
C336	1-163-809-11	CERAMIC CHIP 0.047MF	10%	25V
C337	1-163-809-11	CERAMIC CHIP 0.047MF	10%	25V
C338	1-163-809-11	CERAMIC CHIP 0.047MF	10%	25V
C339	1-124-778-00	ELECT CHIP 22MF	20%	6.3V
C340	1-163-101-00	CERAMIC CHIP 22PF	5%	50V
C341	1-124-779-00	ELECT CHIP 10MF	20%	16V
C342	1-163-021-00	CERAMIC CHIP 0.01MF	10%	50V
C343	1-124-778-00	ELECT CHIP 22MF	20%	6.3V
C344	1-163-809-11	CERAMIC CHIP 0.047MF	10%	25V
C345	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C346	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C347	1-163-021-00	CERAMIC CHIP 0.01MF	10%	50V
C348	1-124-778-00	ELECT CHIP 22MF	20%	6.3V
C349	1-163-109-00	CERAMIC CHIP 47PF	5%	50V
C350	1-163-123-00	CERAMIC CHIP 180PF	5%	50V
C351	1-163-021-00	CERAMIC CHIP 0.01MF	10%	50V
C353	1-124-778-00	ELECT CHIP 22MF	20%	6.3V

CONNECTOR

Ref.No	Part No.	Description
CN001	*1-506-483-21	PIN, CONNECTOR 4P
CN002	*1-506-483-21	PIN, CONNECTOR 4P
CN003	1-566-529-11	CONNECTOR, FPC (ZIF) 13P
CN004	*1-566-540-11	CONNECTOR, FPC (NON ZIF) 8P
CN005	*1-565-532-11	PIN, CONNECTOR (PC BOARD) 7P
CN006	*1-566-537-11	CONNECTOR, FPC (NON ZIF) 5P
CN007	1-566-536-11	CONNECTOR, FPC (ZIF) 20P

TRIMMER

Ref.No	Part No.	Description
CT200	1-141-331-11	CAP, VAR, TRIMMER (CHIP) 30P

DIODE

Ref.No	Part No.	Description
D001	8-719-404-46	DIODE MA110
D003	8-719-404-46	DIODE MA110
D004	8-719-940-45	DIODE DWA010
D050	8-719-938-75	DIODE SB05-05CP
D051	8-719-938-75	DIODE SB05-05CP
D200	8-719-100-03	DIODE 1S2835
D201	8-719-940-45	DIODE DWA010
D203	8-713-300-83	DIODE 1T33C-01
D399	8-719-105-32	DIODE RD2.7M-B2

IC

Ref.No	Part No.	Description	Remark
IC001	8-759-146-30	IC UPD78112GF-540-3BE	
IC002	8-759-100-94	IC UPC358G2	
IC003	8-759-804-72	IC LB1631M	
IC004	8-752-037-09	IC CXA1109M	
IC005	8-759-940-79	IC S-81350AG-REG	
IC006	8-759-107-68	IC CX20115A	
IC007	8-759-805-06	IC CXA1127M	
IC200	8-759-145-69	IC UPD7507HG-552-22	
IC201	8-759-944-88	IC CXK58256MF-15LL	
IC202	8-759-983-52	IC MB87484	
IC203	8-759-101-12	IC UPC311G2	
IC301	8-752-033-38	IC CXA1202R	

COIL

Ref.No	Part No.	Description
L001	1-410-381-11	INDUCTOR CHIP 10UH
L002	1-410-381-11	INDUCTOR CHIP 10UH
L050	1-421-983-11	COIL, CHOKE 700UH
L051	1-421-983-11	COIL, CHOKE 700UH
L052	1-410-627-11	COIL, CHOKE 100UH
L053	1-410-389-11	INDUCTOR CHIP 47UH
L200	1-410-377-11	INDUCTOR CHIP 4.7UH
L201	1-410-377-11	INDUCTOR CHIP 4.7UH
L202	1-410-377-11	INDUCTOR CHIP 4.7UH
L203	1-410-377-11	INDUCTOR CHIP 4.7UH
L204	1-410-384-11	INDUCTOR CHIP 18UH
L301	1-408-777-00	INDUCTOR CHIP 10UH
L302	1-408-793-21	INDUCTOR CHIP 220UH
L303	1-412-029-11	INDUCTOR CHIP 10UH
L304	1-410-385-11	INDUCTOR CHIP 22UH
L305	1-410-732-21	INDUCTOR CHIP 0.18UH
L306	1-410-383-11	INDUCTOR CHIP 15UH
L307	1-412-033-11	INDUCTOR CHIP 220UH
L308	1-412-033-11	INDUCTOR CHIP 220UH

PHOTO TRANSISTOR

Ref.No	Part No.	Description
PH001	8-729-905-07	PHOTO TRANSISTOR PT480FI
PH002	8-729-905-77	PHOTO TRANSISTOR PT480FI

TRANSISTOR

Ref.No	Part No.	Description
Q001	8-729-808-18	TRANSISTOR 2SB926
Q002	8-729-117-32	TRANSISTOR 2SC4177
Q005	8-729-903-10	TRANSISTOR FMW1
Q006	8-729-903-10	TRANSISTOR FMW1
Q007	8-729-905-45	TRANSISTOR DTA143EU
Q008	8-729-117-16	TRANSISTOR 2SA1611-M6
Q051	8-729-805-25	TRANSISTOR 2SB1121
Q052	8-729-805-25	TRANSISTOR 2SB1121
Q053	8-729-904-07	TRANSISTOR FMG2
Q055	8-729-402-42	TRANSISTOR UN5213
Q070	8-729-920-39	TRANSISTOR IMT1US
Q071	8-729-904-07	TRANSISTOR FMG2
Q073	8-729-905-45	TRANSISTOR DTA143EU
Q074	8-729-402-42	TRANSISTOR UN5213
Q075	8-729-403-35	TRANSISTOR UN5113
Q076	8-729-402-42	TRANSISTOR UN5213
Q078	8-729-403-35	TRANSISTOR UN5113
Q079	8-729-905-57	TRANSISTOR DTA124EU
Q080	8-729-805-25	TRANSISTOR 2SB1121

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description	Remark
Q081	8-729-805-25	TRANSISTOR 2SB1121	
Q090	8-729-117-16	TRANSISTOR 2SA1611-M6	
Q201	8-729-117-16	TRANSISTOR 2SA1611-M6	
Q202	8-729-117-32	TRANSISTOR 2SC4177	
Q203	8-729-402-42	TRANSISTOR UN5213	
Q204	8-729-402-42	TRANSISTOR UN5213	
Q205	8-729-402-42	TRANSISTOR UN5213	
Q206	8-729-402-42	TRANSISTOR UN5213	
Q302	8-729-119-76	TRANSISTOR 2SA1175-HFE	
Q303	8-729-216-22	TRANSISTOR 2SA1162	
Q304	8-729-403-35	TRANSISTOR UN5113	
Q305	8-729-403-35	TRANSISTOR UN5113	
Q307	8-729-402-42	TRANSISTOR UN5213	
Q308	8-729-810-25	TRANSISTOR 2SC4397	
Q309	8-729-102-06	TRANSISTOR 2SC2223	
Q310	8-729-102-06	TRANSISTOR 2SC2223	
Q311	8-729-117-32	TRANSISTOR 2SC4177	
Q312	8-729-117-32	TRANSISTOR 2SC4177	
Q313	8-729-117-32	TRANSISTOR 2SC4177	
Q314	8-729-402-42	TRANSISTOR UN5213	
Q315	8-729-905-57	TRANSISTOR DTA124EU	
Q316	8-729-403-35	TRANSISTOR UN5113	
Q317	8-729-117-32	TRANSISTOR 2SC4177	
Q318	8-729-117-32	TRANSISTOR 2SC4177	
Q319	8-729-403-35	TRANSISTOR UN5113	
Q320	8-729-117-32	TRANSISTOR 2SC4177	
Q321	8-729-402-42	TRANSISTOR UN5213	

RESISTOR

Ref.No	Part No.	Description				Remark
R001	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R002	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R003	1-216-186-00	METAL GLAZE	330	5%	1/8W	
R004	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R005	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R006	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R007	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R010	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	
R011	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R012	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R013	1-216-089-00	METAL GLAZE	47K	5%	1/10W	
R014	1-216-113-00	METAL GLAZE	470K	5%	1/10W	
R015	1-216-113-00	METAL GLAZE	470K	5%	1/10W	
R016	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R017	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R018	1-216-089-00	METAL GLAZE	47K	5%	1/10W	
R019	1-216-113-00	METAL GLAZE	470K	5%	1/10W	
R020	1-216-113-00	METAL GLAZE	470K	5%	1/10W	
R021	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R022	1-216-172-00	METAL GLAZE	82	5%	1/8W	
R025	1-216-295-00	METAL GLAZE	0	5%	1/10W	
R026	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R027	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R028	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R029	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R030	1-216-047-00	METAL GLAZE	820	5%	1/10W	
R031	1-216-059-00	METAL GLAZE	2.7K	5%	1/10W	
R032	1-216-041-00	METAL GLAZE	470	5%	1/10W	
R033	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W	
R034	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R038	1-216-089-00	METAL GLAZE	47K	5%	1/10W	
R040	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R041	1-216-089-00	METAL GLAZE	47K	5%	1/10W	
R045	1-216-043-00	METAL GLAZE	560	5%	1/10W	
R050	1-216-041-00	METAL GLAZE	470	5%	1/10W	
R051	1-216-071-00	METAL GLAZE	8.2K	5%	1/10W	
R052	1-216-035-00	METAL GLAZE	270	5%	1/10W	
R053	1-216-298-00	METAL GLAZE	2.2	5%	1/10W	
R054	1-216-298-00	METAL GLAZE	2.2	5%	1/10W	
R055	1-216-298-00	METAL GLAZE	2.2	5%	1/10W	
R056	1-216-041-00	METAL GLAZE	470	5%	1/10W	
R057	1-216-041-00	METAL GLAZE	470	5%	1/10W	
R058	1-216-041-00	METAL GLAZE	470	5%	1/10W	
R059	1-216-037-00	METAL GLAZE	330	5%	1/10W	
R060	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R061	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R062	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R063	1-216-113-00	METAL GLAZE	470K	5%	1/10W	
R067	1-216-295-00	METAL GLAZE	0	5%	1/10W	
R068	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R070	1-216-101-00	METAL GLAZE	150K	5%	1/10W	
R071	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R072	1-216-085-00	METAL GLAZE	33K	5%	1/10W	
R073	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R074	1-216-033-00	METAL GLAZE	220	5%	1/10W	
R075	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R076	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R077	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R078	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R079	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R080	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R081	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R082	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R083	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R084	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R085	1-216-105-00	METAL GLAZE	220K	5%	1/10W	
R086	1-216-105-00	METAL GLAZE	220K	5%	1/10W	
R087	1-216-067-00	METAL GLAZE	5.6K	5%	1/10W	
R090	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R091	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R092	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W	
R093	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W	
R094	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R095	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R096	1-216-107-00	METAL GLAZE	270K	5%	1/10W	
R097	1-216-089-00	METAL GLAZE	47K	5%	1/10W	
R100	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	

When indicating parts by reference number, please include the board name.

SS-93P

Ref.No	Part No.	Description				Remark
R101	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	
R102	1-216-009-00	METAL GLAZE	22	5%	1/10W	
R103	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R104	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R108	1-216-063-00	METAL GLAZE	3.9K	5%	1/10W	
R109	1-216-136-00	METAL GLAZE	2.7	5%	1/8W	
R110	1-216-089-00	METAL GLAZE	47K	5%	1/10W	
R111	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	
R112	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	
R114	1-216-051-00	METAL GLAZE	1.2K	5%	1/10W	
R115	1-216-069-00	METAL GLAZE	6.8K	5%	1/10W	
R116	1-216-134-00	METAL GLAZE	2.2	5%	1/8W	
R117	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	
R200	1-216-121-00	METAL GLAZE	1M	5%	1/10W	
R201	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	
R202	1-216-081-00	METAL GLAZE	22K	5%	1/10W	
R203	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	
R204	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R205	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R207	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R208	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R209	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R210	1-216-295-00	METAL GLAZE	0	5%	1/10W	
R211	1-216-295-00	METAL GLAZE	0	5%	1/10W	
R212	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R213	1-216-043-00	METAL GLAZE	560	5%	1/10W	
R214	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W	
R215	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W	
R216	1-216-063-00	METAL GLAZE	3.9K	5%	1/10W	
R217	1-216-089-00	METAL GLAZE	47K	5%	1/10W	
R229	1-216-295-00	METAL GLAZE	0	5%	1/10W	
R230	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R231	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R233	1-216-089-00	METAL GLAZE	47K	5%	1/10W	
R236	1-216-045-00	METAL GLAZE	680	5%	1/10W	
R240	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R242	1-216-089-00	METAL GLAZE	47K	5%	1/10W	
R243	1-216-089-00	METAL GLAZE	47K	5%	1/10W	
R244	1-216-089-00	METAL GLAZE	47K	5%	1/10W	
R304	1-216-009-00	METAL GLAZE	22	5%	1/10W	
R305	1-216-043-00	METAL GLAZE	560	5%	1/10W	
R306	1-216-037-00	METAL GLAZE	330	5%	1/10W	
R307	1-216-041-00	METAL GLAZE	470	5%	1/10W	
R308	1-216-081-00	METAL GLAZE	22K	5%	1/10W	
R309	1-216-085-00	METAL GLAZE	33K	5%	1/10W	
R311	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	
R312	1-216-081-00	METAL GLAZE	22K	5%	1/10W	
R313	1-216-063-00	METAL GLAZE	3.9K	5%	1/10W	
R314	1-216-071-00	METAL GLAZE	8.2K	5%	1/10W	
R315	1-216-089-00	METAL GLAZE	47K	5%	1/10W	
R316	1-216-081-00	METAL GLAZE	22K	5%	1/10W	
R318	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R319	1-216-041-00	METAL GLAZE	470	5%	1/10W	

Ref.No	Part No.	Description				Remark
R320	1-215-101-00	METAL GLAZE	150K	5%	1/10W	
R321	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	
R322	1-216-101-00	METAL GLAZE	150K	5%	1/10W	
R323	1-216-095-00	METAL GLAZE	82K	5%	1/10W	
R324	1-216-081-00	METAL GLAZE	22K	5%	1/10W	
R325	1-216-081-00	METAL GLAZE	22K	5%	1/10W	
R326	1-216-081-00	METAL GLAZE	22K	5%	1/10W	
R327	1-216-081-00	METAL GLAZE	22K	5%	1/10W	
R328	1-216-085-00	METAL GLAZE	33K	5%	1/10W	
R329	1-216-077-00	METAL GLAZE	15K	5%	1/10W	
R331	1-216-047-00	METAL GLAZE	820	5%	1/10W	
R332	1-216-051-00	METAL GLAZE	1.2K	5%	1/10W	
R334	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R335	1-216-081-00	METAL GLAZE	22K	5%	1/10W	
R336	1-216-081-00	METAL GLAZE	22K	5%	1/10W	
R337	1-216-053-00	METAL GLAZE	1.5K	5%	1/10W	
R338	1-216-083-00	METAL GLAZE	27K	5%	1/10W	
R339	1-216-083-00	METAL GLAZE	27K	5%	1/10W	
R340	1-216-053-00	METAL GLAZE	1.5K	5%	1/10W	
R341	1-216-081-00	METAL GLAZE	22K	5%	1/10W	
R342	1-216-071-00	METAL GLAZE	8.2K	5%	1/10W	
R343	1-216-059-00	METAL GLAZE	2.7K	5%	1/10W	
R344	1-216-029-00	METAL GLAZE	150	5%	1/10W	
R345	1-216-041-00	METAL GLAZE	470	5%	1/10W	
R346	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R347	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R348	1-216-063-00	METAL GLAZE	3.9K	5%	1/10W	
R349	1-216-041-00	METAL GLAZE	470	5%	1/10W	
R350	1-216-055-00	METAL GLAZE	1.8K	5%	1/10W	
R351	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R352	1-216-053-00	METAL GLAZE	1.5K	5%	1/10W	
R353	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R354	1-216-027-00	METAL GLAZE	120	5%	1/10W	
R355	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R356	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R357	1-216-035-00	METAL GLAZE	270	5%	1/10W	
R358	1-216-041-00	METAL GLAZE	470	5%	1/10W	
R360	1-216-121-00	METAL GLAZE	1M	5%	1/10W	

VARIABLE RESISTOR

RV001	1-230-873-11	RES, ADJ, METAL GLAZE 47K
RV002	1-230-874-11	RES, ADJ, METAL GLAZE 100K
RV200	1-230-867-11	RES, ADJ, METAL GLAZE 1K
RV301	1-230-873-11	RES, ADJ, METAL GLAZE 47K
RV302	1-230-873-11	RES, ADJ, METAL GLAZE 47K
RV306	1-230-868-11	RES, ADJ, METAL GLAZE 2.2K

CRYSTAL

X001	1-567-885-11	VIBRATOR, CRYSTAL
X200	1-567-152-00	VIBRATOR, CERAMIC

****

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description		Remark
	*A-7061-713-A	VA-43P BOARD, COMPLETE ************************		(Ref.No 2,000 Series)
	*3-725-136-01	REINFORCEMENT, VA-SS		
		CAPACITOR		
C251	1-162-638-11	CERAMIC CHIP 1MF		16V
C252	1-162-638-11	CERAMIC CHIP 1MF		16V
C253	1-163-021-00	CERAMIC CHIP 0.01MF	10%	50V
C254	1-163-105-00	CERAMIC CHIP 33PF	5%	50V
C255	1-163-105-00	CERAMIC CHIP 33PF	5%	50V
C256	1-124-778-00	ELECT CHIP 22MF	20%	6.3V
C257	1-163-021-00	CERAMIC CHIP 0.01MF		50V
C258	1-124-778-00	ELECT CHIP 22MF	20%	6.3V
C259	1-162-638-11	CERAMIC CHIP 1MF		16V
C260	1-163-009-11	CERAMIC CHIP 0.001MF	10%	50V
C261	1-163-009-11	CERAMIC CHIP 0.001MF	10%	50V
C262	1-163-033-00	CERAMIC CHIP 0.022MF		50V
C263	1-163-033-00	CERAMIC CHIP 0.022MF		50V
C264	1-163-809-11	CERAMIC CHIP 0.047MF	10%	25V
C265	1-163-021-00	CERAMIC CHIP 0.01MF		50V
C266	1-163-809-11	CERAMIC CHIP 0.047MF	10%	25V
C267	1-163-035-00	CERAMIC CHIP 0.047MF		50V
C268	1-163-125-00	CERAMIC CHIP 220PF	5%	50V
C269	1-163-017-00	CERAMIC CHIP 0.0047MF	10%	50V
C270	1-163-015-00	CERAMIC CHIP 0.0033MF	10%	50V
C271	1-163-137-00	CERAMIC CHIP 680PF	5%	50V
C272	1-162-638-11	CERAMIC CHIP 1MF		16V
C273	1-163-135-00	CERAMIC CHIP 560PF	5%	50V
C274	1-163-009-11	CERAMIC CHIP 0.001MF	10%	50V
C275	1-163-109-00	CERAMIC CHIP 47PF	5%	50V
C276	1-163-145-00	CERAMIC CHIP 0.0015MF	10%	50V
C277	1-163-101-00	CERAMIC CHIP 22PF	5%	50V
C278	1-163-038-00	CERAMIC CHIP 0.1MF		25V
C280	1-124-279-11	ELECT 3.3MF	20%	25V
C360	1-162-638-11	CERAMIC CHIP 1MF		16V
C361	1-163-077-00	CERAMIC CHIP 0.1MF	10%	25V
C362	1-163-035-00	CERAMIC CHIP 0.047MF		50V
C363	1-126-199-11	ELECT CHIP 6.8MF	20%	35V
C364	1-124-779-00	ELECT CHIP 10MF	20%	16V
C365	1-163-035-00	CERAMIC CHIP 0.047MF		50V
C366	1-163-033-00	CERAMIC CHIP 0.022MF		50V
C367	1-124-779-00	ELECT CHIP 10MF	20%	16V
C368	1-162-638-11	CERAMIC CHIP 1MF		16V
C369	1-162-638-11	CERAMIC CHIP 1MF		16V
C370	1-124-779-00	ELECT CHIP 10MF	20%	16V
C371	1-162-638-11	CERAMIC CHIP 1MF		16V
C372	1-163-033-00	CERAMIC CHIP 0.022MF		50V
C373	1-124-778-00	ELECT CHIP 22MF	20%	6.3V
C374	1-126-193-11	ELECT CHIP 1MF	20%	50V
C375	1-162-638-11	CERAMIC CHIP 1MF		16V
C376	1-126-193-11	ELECT CHIP 1MF	20%	50V
C377	1-126-193-11	ELECT CHIP 1MF	20%	50V
C378	1-124-779-00	ELECT CHIP 10MF	20%	16V
C379	1-163-021-00	CERAMIC CHIP 0.01MF	10%	50V
C380	1-124-779-00	ELECT CHIP 10MF	20%	16V
C381	1-124-779-00	ELECT CHIP 10MF	20%	16V
C382	1-124-779-00	ELECT CHIP 10MF	20%	16V
C383	1-124-779-00	ELECT CHIP 10MF	20%	16V
C384	1-124-779-00	ELECT CHIP 10MF	20%	16V
C385	1-163-021-00	CERAMIC CHIP 0.01MF		50V
C386	1-163-141-00	CERAMIC CHIP 0.001MF	5%	50V
C387	1-163-033-00	CERAMIC CHIP 0.022MF		50V
C388	1-124-778-00	ELECT CHIP 22MF	20%	6.3V
C389	1-163-101-00	CERAMIC CHIP 22PF	5%	50V
C390	1-163-127-00	CERAMIC CHIP 270PF	5%	50V
C391	1-124-779-00	ELECT CHIP 10MF	20%	16V
C392	1-163-111-00	CERAMIC CHIP 56PF	5%	50V
C393	1-124-778-00	ELECT CHIP 22MF	20%	6.3V
C394	1-163-033-00	CERAMIC CHIP 0.022MF		50V
C395	1-163-133-00	CERAMIC CHIP 470PF	5%	50V
C396	1-163-131-00	CERAMIC CHIP 390PF	5%	50V
C397	1-163-117-00	CERAMIC CHIP 100PF	5%	50V
C398	1-163-121-00	CERAMIC CHIP 150PF	5%	50V
C400	1-163-038-00	CERAMIC CHIP 0.1MF		25V
C401	1-124-779-00	ELECT CHIP 10MF	20%	16V
C402	1-163-123-00	CERAMIC CHIP 180PF	5%	50V
C403	1-124-778-00	ELECT CHIP 22MF	20%	6.3V
C404	1-163-021-00	CERAMIC CHIP 0.01MF		50V
C406	1-163-033-00	CERAMIC CHIP 0.022MF		50V
C407	1-163-033-00	CERAMIC CHIP 0.022MF		50V
C408	1-163-089-00	CERAMIC CHIP 6PF	0.25PF	50V
C409	1-163-033-00	CERAMIC CHIP 0.022MF		50V
C410	1-163-038-00	CERAMIC CHIP 0.1MF		25V
C411	1-163-109-00	CERAMIC CHIP 47PF	5%	50V
C412	1-163-105-00	CERAMIC CHIP 33PF	5%	50V
C413	1-163-021-00	CERAMIC CHIP 0.01MF		50V
C414	1-162-638-11	CERAMIC CHIP 1MF		16V
C415	1-126-205-11	ELECT CHIP 47MF	20%	6.3V
C416	1-135-145-11	TANTAL. CHIP 0.47MF	20%	35V
C417	1-135-145-11	TANTAL. CHIP 0.47MF	20%	35V
C418	1-163-125-00	CERAMIC CHIP 220PF	5%	50V
C419	1-163-113-00	CERAMIC CHIP 68PF	5%	50V
C420	1-163-114-00	CERAMIC CHIP 75PF	5%	50V
C421	1-163-123-00	CERAMIC CHIP 180PF	5%	50V
C422	1-163-021-00	CERAMIC CHIP 0.01MF		50V
C423	1-163-107-00	CERAMIC CHIP 39PF	5%	50V
C424	1-163-097-00	CERAMIC CHIP 15PF	5%	50V
C425	1-163-021-00	CERAMIC CHIP 0.01MF		50V
C426	1-163-015-00	CERAMIC CHIP 0.0033MF	10%	50V
C427	1-163-115-00	CERAMIC CHIP 82PF	5%	50V
C428	1-163-038-00	CERAMIC CHIP 0.1MF		25V
C429	1-163-109-00	CERAMIC CHIP 47PF	5%	50V
C430	1-163-033-00	CERAMIC CHIP 0.022MF		50V
C431	1-163-033-00	CERAMIC CHIP 0.022MF		50V
C432	1-124-779-00	ELECT CHIP 10MF	20%	16V

When indicating parts by reference number, please include the board name.

VA-43

Ref.No	Part No.	Description			Remark
C433	1-124-779-00	ELECT CHIP	10MF	20%	16V
C434	1-163-033-00	CERAMIC CHIP	0.022MF		50V
C436	1-163-101-00	CERAMIC CHIP	22PF	5%	50V
C437	1-163-012-00	CERAMIC CHIP	0.0018MF	10%	50V
C438	1-163-109-00	CERAMIC CHIP	47PF	5%	50V
C439	1-163-133-00	CERAMIC CHIP	470PF	5%	50V
C440	1-163-127-00	CERAMIC CHIP	270PF	5%	50V
C441	1-163-033-00	CERAMIC CHIP	0.022MF		50V
C442	1-163-097-00	CERAMIC CHIP	15PF	5%	50V
C444	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V
C445	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V
C446	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C447	1-163-093-00	CERAMIC CHIP	10PF	5%	50V
C448	1-163-033-00	CERAMIC CHIP	0.022MF		50V
C449	1-163-141-00	CERAMIC CHIP	0.001MF	5%	50V
C450	1-163-141-00	CERAMIC CHIP	0.001MF	5%	50V
C451	1-163-021-00	CERAMIC CHIP	0.01MF		50V
C452	1-163-021-00	CERAMIC CHIP	0.01MF		50V
C453	1-164-005-11	CERAMIC CHIP	0.47MF		25V
C454	1-163-021-00	CERAMIC CHIP	0.01MF		50V
C455	1-163-021-00	CERAMIC CHIP	0.01MF		50V
C457	1-163-118-00	CERAMIC CHIP	110PF	5%	50V
C458	1-163-009-11	CERAMIC CHIP	0.001MF	10%	50V
C459	1-135-149-21	TANTAL. CHIP	2.2MF	20%	10V
C460	1-163-009-11	CERAMIC CHIP	0.001MF	10%	50V
C461	1-126-198-11	ELECT CHIP	4.7MF	20%	35V
C462	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V
C463	1-163-009-11	CERAMIC CHIP	0.001MF	10%	50V
C464	1-163-021-00	CERAMIC CHIP	0.01MF		50V
C465	1-135-091-00	TANTAL. CHIP	1MF	20%	16V
C466	1-163-117-00	CERAMIC CHIP	100PF	5%	50V
C467	1-163-093-00	CERAMIC CHIP	10PF	5%	50V
C468	1-163-099-00	CERAMIC CHIP	18PF	5%	50V
C469	1-163-109-00	CERAMIC CHIP	47PF	5%	50V
C470	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C471	1-163-021-00	CERAMIC CHIP	0.01MF		50V
C472	1-163-086-00	CERAMIC CHIP	3PF	0.25PF	50V
C473	1-163-021-00	CERAMIC CHIP	0.01MF		50V
C474	1-124-779-00	ELECT CHIP	10MF	20%	16V
C475	1-163-033-00	CERAMIC CHIP	0.022MF		50V
C476	1-163-033-00	CERAMIC CHIP	0.022MF		50V
C477	1-163-021-00	CERAMIC CHIP	0.01MF		50V
C478	1-163-131-00	CERAMIC CHIP	390PF	5%	50V
C479	1-163-033-00	CERAMIC CHIP	0.022MF		50V
C480	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C481	1-163-015-00	CERAMIC CHIP	0.0033MF	10%	50V
C482	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C483	1-163-021-00	CERAMIC CHIP	0.01MF		50V
C484	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C485	1-124-778-00	ELECT CHIP	22MF	20%	6.3V
C488	1-163-033-00	CERAMIC CHIP	0.022MF		50V
C489	1-124-778-00	ELECT CHIP	22MF	20%	6.3V
C490	1-163-033-00	CERAMIC CHIP	0.022MF		50V
C491	1-124-779-00	ELECT CHIP	10MF	20%	16V
C492	1-162-638-11	CERAMIC CHIP	1MF		16V
C493	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C494	1-124-779-00	ELECT CHIP	10MF	20%	16V
C495	1-124-779-00	ELECT CHIP	10MF	20%	16V
C496	1-126-246-11	ELECT CHIP	220MF	20%	4V
C497	1-124-778-00	ELECT CHIP	22MF	20%	6.3V
C498	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C499	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C500	1-126-208-11	ELECT CHIP	47MF	20%	4V
C501	1-163-033-00	CERAMIC CHIP	0.022MF		50V
C502	1-163-021-00	CERAMIC CHIP	0.01MF		50V
C503	1-163-021-00	CERAMIC CHIP	0.01MF		50V
C504	1-163-109-00	CERAMIC CHIP	47PF	5%	50V
C505	1-163-109-00	CERAMIC CHIP	47PF	5%	50V
C506	1-124-778-00	ELECT CHIP	22MF	20%	6.3V
C507	1-126-193-11	ELECT CHIP	1MF	20%	50V
C508	1-126-205-11	ELECT CHIP	47MF	20%	6.3V
C509	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C510	1-135-157-21	TANTAL. CHIP	10MF	20%	6.3V
C511	1-163-033-00	CERAMIC CHIP	0.022MF		50V
C512	1-163-111-00	CERAMIC CHIP	56PF	5%	50V
C513	1-163-105-00	CERAMIC CHIP	33PF	5%	50V
C514	1-124-779-00	ELECT CHIP	10MF	20%	16V
C515	1-162-638-11	CERAMIC CHIP	1MF		16V
C516	1-163-021-00	CERAMIC CHIP	0.01MF		50V
C517	1-135-176-21	TANTAL. CHIP	0.68MF	20%	35V
C518	1-126-195-11	ELECT CHIP	2.2MF	20%	50V
C519	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C520	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C521	1-163-033-00	CERAMIC CHIP	0.022MF		50V
C522	1-163-101-00	CERAMIC CHIP	22PF	5%	50V
C523	1-163-133-00	CERAMIC CHIP	470PF	5%	50V
C524	1-163-033-00	CERAMIC CHIP	0.022MF		50V
C525	1-163-121-00	CERAMIC CHIP	150PF	5%	50V
C526	1-163-081-00	CERAMIC CHIP	0.22MF		25V
C527	1-163-099-00	CERAMIC CHIP	18PF	5%	50V
C528	1-163-034-00	CERAMIC CHIP	0.033MF		50V
C530	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C531	1-163-035-00	CERAMIC CHIP	0.047MF		50V
C576	1-163-131-00	CERAMIC CHIP	390PF	5%	50V
C579	1-163-091-00	CERAMIC CHIP	8PF	0.25PF	50V
C580	1-163-019-00	CERAMIC CHIP	0.0068MF	10%	50V
C581	1-163-021-00	CERAMIC CHIP	0.01MF		50V
C582	1-126-209-11	ELECT CHIP	100MF	20%	4V
C584	1-163-141-00	CERAMIC CHIP	0.001MF	5%	50V
C585	1-162-638-11	CERAMIC CHIP	1MF		16V
C586	1-126-207-11	ELECT CHIP	33MF	20%	4V
C587	1-126-207-11	ELECT CHIP	33MF	20%	4V
C588	1-135-091-00	TANTAL. CHIP	1MF	20%	16V
C589	1-163-009-11	CERAMIC CHIP	0.001MF	10%	50V
C590	1-126-205-11	ELECT CHIP	47MF	20%	6.3V
C591	1-135-151-21	TANTAL. CHIP	4.7MF	20%	4V

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description	Remark
C593	1-126-206-11	ELECT CHIP 100MF 20%	6.3V
C594	1-126-206-11	ELECT CHIP 100MF 20%	6.3V
C595	1-135-151-21	TANTAL. CHIP 4.7MF 20%	4V
C598	1-163-033-00	CERAMIC CHIP 0.022MF	50V
C600	1-163-145-00	CERAMIC CHIP 0.0015MF 10%	50V
C601	1-163-033-00	CERAMIC CHIP 0.022MF	50V
C603	1-163-121-00	CERAMIC CHIP 150PF 5%	50V
C604	1-162-638-11	CERAMIC CHIP 1MF	16V
C605	1-164-161-11	CERAMIC CHIP 0.0022MF 10%	50V
C606	1-135-091-00	TANTAL. CHIP 1MF 20%	16V
C610	1-162-638-11	CERAMIC CHIP 1MF	16V

CONNECTOR

Ref.No	Part No.	Description	Remark
CN360	*1-565-543-11	PIN, CONNECTOR (PC BOARD) 4P	
CN361	*1-566-758-11	PIN, CONNECTOR (PC BOARD) 3P	

TRIMMER

Ref.No	Part No.	Description	Remark
CV360	1-141-331-11	CAP, VAR, TRIMMER (CHIP) 30P	
CV361	1-141-311-11	CAP, VAR, TRIMMER (CHIP) 20P	

DIODE

Ref.No	Part No.	Description	Remark
D361	8-719-100-05	DIODE 1S2837	
D362	8-719-800-76	DIODE 1SS226	
D363	8-719-800-76	DIODE 1SS226	
D364	8-719-100-05	DIODE 1S2837	
D365	8-719-800-76	DIODE 1SS226	
D367	8-719-800-76	DIODE 1SS226	
D368	8-719-106-43	DIODE RD9.1M-B1	
D372	8-719-100-05	DIODE 1S2837	

DELAY LINE

Ref.No	Part No.	Description	Remark
DL360	1-415-593-11	DELAY LINE, ULTRASONIC GLASS	

FILTER

Ref.No	Part No.	Description	Remark
FL361	1-577-162-11	FILTER, CERAMIC (5.17MHz)	
FL362	1-236-186-21	FILTER, BAND PASS (4.43MHz)	
FL363	1-409-446-21	FILTER, TRAP (5.89MHz)	
FL365	1-236-188-21	FILTER, BAND PASS (4.43MHz)	
FL580	1-236-145-11	FILTER, BAND PASS (1.5MHz)	

IC

Ref.No	Part No.	Description	Remark
IC250	8-759-209-53	IC CXA1204Q	
IC360	8-752-034-40	IC CXA1200BQ	
IC361	8-752-324-87	IC CXL1502M	
IC362	8-752-033-40	IC CXA1201Q	
IC363	8-759-605-61	IC CXA1203N	
IC364	8-759-710-09	IC NJM2233AM	
IC365	8-759-710-09	IC NJM2233AM	
IC366	8-759-100-93	IC UPC393G2	
IC367	8-759-204-51	IC TC40H008F	
IC368	8-759-140-26	IC UPD6145G-601	
IC580	8-741-150-51	IC SBX1505-21	

COIL

Ref.No	Part No.	Description	Remark
L250	1-408-789-21	INDUCTOR CHIP 100UH	
L251	1-408-795-21	INDUCTOR CHIP 330UH	
L252	1-410-393-11	INDUCTOR CHIP 100UH	
L362	1-412-031-11	INDUCTOR CHIP 47UH	
L363	1-412-031-11	INDUCTOR CHIP 47UH	
L364	1-412-029-11	INDUCTOR CHIP 10UH	
L365	1-412-031-11	INDUCTOR CHIP 47UH	
L366	1-410-383-11	INDUCTOR CHIP 15UH	
L367	1-410-385-11	INDUCTOR CHIP 22UH	
L368	1-410-393-11	INDUCTOR CHIP 100UH	
L369	1-410-393-11	INDUCTOR CHIP 100UH	
L370	1-410-392-11	INDUCTOR CHIP 82UH	
L371	1-410-393-11	INDUCTOR CHIP 100UH	
L372	1-410-393-11	INDUCTOR CHIP 100UH	
L373	1-410-656-11	INDUCTOR CHIP 150UH	
L374	1-410-380-31	INDUCTOR CHIP 8.2UH	
L375	1-408-795-21	INDUCTOR CHIP 330UH	
L376	1-410-655-11	INDUCTOR CHIP 120UH	
L377	1-410-387-11	INDUCTOR CHIP 33UH	
L379	1-410-657-21	INDUCTOR CHIP 180UH	
L380	1-410-657-21	INDUCTOR CHIP 180UH	
L381	1-408-795-21	INDUCTOR CHIP 330UH	
L382	1-410-167-41	INDUCTOR CHIP 820UH	
L383	1-408-795-21	INDUCTOR CHIP 330UH	
L384	1-410-393-11	INDUCTOR CHIP 100UH	
L385	1-410-381-11	INDUCTOR CHIP 10UH	
L386	1-410-390-11	INDUCTOR CHIP 56UH	
L387	1-410-388-21	INDUCTOR CHIP 39UH	
L391	1-410-390-11	INDUCTOR CHIP 56UH	
L392	1-410-384-31	INDUCTOR CHIP 18UH	
L393	1-410-387-11	INDUCTOR CHIP 33UH	
L395	1-410-388-21	INDUCTOR CHIP 39UH	
L396	1-410-391-11	INDUCTOR CHIP 68UH	
L580	1-408-785-21	INDUCTOR CHIP 47UH	

TRANSISTOR

Ref.No	Part No.	Description	Remark
Q250	8-729-905-23	TRANSISTOR 2SA1576-R	
Q251	8-729-905-35	TRANSISTOR 2SC4081-R	
Q252	8-729-905-23	TRANSISTOR 2SA1576-R	
Q253	8-729-109-42	TRANSISTOR 2SK94-X2	
Q254	8-729-905-18	TRANSISTOR DTC144EU	
Q361	8-729-101-07	TRANSISTOR 2SB804-AW	
Q362	8-729-905-23	TRANSISTOR 2SA1576-R	
Q363	8-729-905-23	TRANSISTOR 2SA1576-R	
Q364	8-729-905-23	TRANSISTOR 2SA1576-R	
Q365	8-729-905-35	TRANSISTOR 2SC4081-R	
Q366	8-729-905-35	TRANSISTOR 2SC4081-R	
Q367	8-729-905-23	TRANSISTOR 2SA1576-R	
Q368	8-729-905-23	TRANSISTOR 2SA1576-R	
Q369	8-729-905-35	TRANSISTOR 2SC4081-R	
Q370	8-729-905-35	TRANSISTOR 2SC4081-R	

When indicating parts by reference number, please include the board name.

VA-43

Ref.No	Part No.	Description	Remark
Q371	8-729-905-35	TRANSISTOR 2SC4081-R	
Q372	8-729-905-35	TRANSISTOR 2SC4081-R	
Q373	8-729-905-35	TRANSISTOR 2SC4081-R	
Q374	8-729-905-35	TRANSISTOR 2SC4081-R	
Q375	8-729-905-35	TRANSISTOR 2SC4081-R	
Q376	8-729-905-35	TRANSISTOR 2SC4081-R	
Q377	8-729-905-35	TRANSISTOR 2SC4081-R	
Q378	8-729-905-12	TRANSISTOR DTA144EU	
Q379	8-729-905-35	TRANSISTOR 2SC4081-R	
Q380	8-729-101-07	TRANSISTOR 2SB804-AW	
Q381	8-729-905-35	TRANSISTOR 2SC4081-R	
Q382	8-729-905-15	TRANSISTOR DTC144WU	
Q383	8-729-905-35	TRANSISTOR 2SC4081-R	
Q384	8-729-905-23	TRANSISTOR 2SA1576-R	
Q385	8-729-905-35	TRANSISTOR 2SC4081-R	
Q386	8-729-905-35	TRANSISTOR 2SC4081-R	
Q387	8-729-905-23	TRANSISTOR 2SA1576-R	
Q388	8-729-102-07	TRANSISTOR 2SC2223-F13	
Q389	8-729-905-35	TRANSISTOR 2SC4081-R	
Q390	8-729-905-35	TRANSISTOR 2SC4081-R	
Q391	8-729-905-35	TRANSISTOR 2SC4081-R	
Q392	8-729-905-35	TRANSISTOR 2SC4081-R	
Q393	8-729-905-35	TRANSISTOR 2SC4081-R	
Q394	8-729-905-23	TRANSISTOR 2SA1576-R	
Q395	8-729-905-12	TRANSISTOR DTA144EU	
Q396	8-729-905-XX	TRANSISTOR DTC114TU	
Q397	8-729-905-18	TRANSISTOR DTC144EU	
Q398	8-729-905-18	TRANSISTOR DTC144EU	
Q399	8-729-102-07	TRANSISTOR 2SC2223-F13	
Q400	8-729-102-07	TRANSISTOR 2SC2223-F13	
Q401	8-729-122-63	TRANSISTOR 2SA1226	
Q402	8-729-216-22	TRANSISTOR 2SA1162	
Q403	8-729-216-22	TRANSISTOR 2SA1162	
Q404	8-729-216-22	TRANSISTOR 2SA1162	
Q405	8-729-905-18	TRANSISTOR DTC144EU	
Q406	8-729-102-07	TRANSISTOR 2SC2223-F13	
Q407	8-729-905-57	TRANSISTOR DTA124EU	
Q408	8-729-102-07	TRANSISTOR 2SC2223-F13	
Q409	8-729-102-07	TRANSISTOR 2SC2223-F13	
Q410	8-729-905-35	TRANSISTOR 2SC4081-R	
Q411	8-729-905-35	TRANSISTOR 2SC4081-R	
Q412	8-729-905-35	TRANSISTOR 2SC4081-R	
Q413	8-729-905-12	TRANSISTOR DTA144EU	
Q414	8-729-102-07	TRANSISTOR 2SC2223-F13	
Q415	8-729-216-22	TRANSISTOR 2SA1162	
Q416	8-729-905-61	TRANSISTOR DTC124EU	
Q417	8-729-905-61	TRANSISTOR DTC124EU	
Q418	8-729-905-57	TRANSISTOR DTA124EU	
Q420	8-729-905-18	TRANSISTOR DTC144EU	
Q421	8-729-905-35	TRANSISTOR 2SC4081	
Q423	8-729-421-23	TRANSISTOR XN1216	
Q424	8-729-905-18	TRANSISTOR DTC144EU	
Q425	8-729-905-35	TRANSISTOR 2SC4081-R	

Ref.No	Part No.	Description	Remark
Q426	8-729-905-35	TRANSISTOR 2SC4081-R	
Q427	8-729-905-23	TRANSISTOR 2SA1576-R	
Q430	8-729-905-18	TRANSISTOR DTC144EU	
Q431	8-729-904-41	TRANSISTOR FMY3	
Q432	8-729-421-23	TRANSISTOR XN1216	
Q433	8-729-907-39	TRANSISTOR IMD2	
Q434	8-729-402-81	TRANSISTOR XN4501	
Q435	8-729-905-57	TRANSISTOR DTA124EU	
Q436	8-729-905-61	TRANSISTOR DTC124EU	
Q437	8-729-905-35	TRANSISTOR 2SC4081-R	
Q580	8-729-905-35	TRANSISTOR 2SC4081-R	
Q581	8-729-905-35	TRANSISTOR 2SC4081-R	
Q582	8-729-905-35	TRANSISTOR 2SC4081-R	

RESISTOR

Ref.No	Part No.	Description				Remark
R251	1-216-081-00	METAL GLAZE	22K	5%	1/10W	
R252	1-216-748-11	METAL GLAZE	39K	5%	1/10W	
R253	1-216-121-00	METAL GLAZE	1M	5%	1/10W	
R254	1-216-051-00	METAL GLAZE	1.2K	5%	1/10W	
R255	1-216-041-00	METAL GLAZE	470	5%	1/10W	
R256	1-216-041-00	METAL GLAZE	470	5%	1/10W	
R257	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R258	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R259	1-216-113-00	METAL GLAZE	470K	5%	1/10W	
R260	1-216-085-00	METAL GLAZE	33K	5%	1/10W	
R261	1-216-081-00	METAL GLAZE	22K	5%	1/10W	
R262	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R263	1-216-035-00	METAL GLAZE	270	5%	1/10W	
R264	1-216-031-00	METAL GLAZE	180	5%	1/10W	
R265	1-216-081-00	METAL GLAZE	22K	5%	1/10W	
R266	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W	
R267	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W	
R268	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	
R269	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W	
R270	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W	
R271	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	
R272	1-216-109-00	METAL GLAZE	330K	5%	1/10W	
R273	1-216-089-00	METAL GLAZE	47K	5%	1/10W	
R274	1-216-089-00	METAL GLAZE	47K	5%	1/10W	
R276	1-216-071-00	METAL GLAZE	8.2K	5%	1/10W	
R277	1-216-069-00	METAL GLAZE	6.8K	5%	1/10W	
R361	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R362	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R363	1-216-121-00	METAL GLAZE	1M	5%	1/10W	
R364	1-216-121-00	METAL GLAZE	1M	5%	1/10W	
R365	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	
R366	1-216-051-00	METAL GLAZE	1.2K	5%	1/10W	
R367	1-216-053-00	METAL GLAZE	1.5K	5%	1/10W	
R368	1-216-117-00	METAL GLAZE	680K	5%	1/10W	
R369	1-216-093-00	METAL GLAZE	68K	5%	1/10W	
R370	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R371	1-216-663-11	METAL CHIP	3.3K	0.50%	1/10W	
R372	1-216-091-00	METAL GLAZE	56K	5%	1/10W	

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description				Remark
R373	1-216-043-00	METAL GLAZE	560	5%	1/10W	
R257	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R374	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R375	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R376	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R377	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	
R378	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R379	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R380	1-216-027-00	METAL GLAZE	120	5%	1/10W	
R381	1-216-651-11	METAL CHIP	1K	0.50%	1/10W	
R382	1-216-643-11	METAL CHIP	470	0.50%	1/10W	
R383	1-216-059-00	METAL GLAZE	2.7K	5%	1/10W	
R384	1-216-071-00	METAL GLAZE	8.2K	5%	1/10W	
R385	1-216-047-00	METAL GLAZE	820	5%	1/10W	
R386	1-216-113-00	METAL GLAZE	470K	5%	1/10W	
R387	1-216-113-00	METAL GLAZE	470K	5%	1/10W	
R388	1-216-053-00	METAL GLAZE	1.5K	5%	1/10W	
R389	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	
R390	1-216-059-00	METAL GLAZE	2.7K	5%	1/10W	
R391	1-216-069-00	METAL GLAZE	6.8K	5%	1/10W	
R392	1-216-067-00	METAL GLAZE	5.6K	5%	1/10W	
R394	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W	
R395	1-216-047-00	METAL GLAZE	820	5%	1/10W	
R396	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	
R397	1-216-081-00	METAL GLAZE	22K	5%	1/10W	
R398	1-216-045-00	METAL GLAZE	680	5%	1/10W	
R399	1-216-037-00	METAL GLAZE	330	5%	1/10W	
R400	1-216-295-00	METAL GLAZE	0	5%	1/10W	
R401	1-216-047-00	METAL GLAZE	820	5%	1/10W	
R403	1-216-053-00	METAL GLAZE	1.5K	5%	1/10W	
R405	1-216-083-00	METAL GLAZE	27K	5%	1/10W	
R406	1-216-055-00	METAL GLAZE	1.8K	5%	1/10W	
R407	1-216-295-00	METAL GLAZE	0	5%	1/10W	
R408	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R409	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R410	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R411	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R412	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R413	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R414	1-216-043-00	METAL GLAZE	560	5%	1/10W	
R415	1-216-043-00	METAL GLAZE	560	5%	1/10W	
R416	1-216-063-00	METAL GLAZE	3.9K	5%	1/10W	
R417	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R418	1-216-077-00	METAL GLAZE	15K	5%	1/10W	
R419	1-216-041-00	METAL GLAZE	470	5%	1/10W	
R420	1-216-041-00	METAL GLAZE	470	5%	1/10W	
R421	1-216-043-00	METAL GLAZE	560	5%	1/10W	
R422	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R423	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R424	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	
R425	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R426	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R427	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R428	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R429	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R430	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R431	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R432	1-216-069-00	METAL GLAZE	6.8K	5%	1/10W	
R433	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W	
R434	1-216-051-00	METAL GLAZE	1.2K	5%	1/10W	
R435	1-216-055-00	METAL GLAZE	1.8K	5%	1/10W	
R436	1-216-055-00	METAL GLAZE	1.8K	5%	1/10W	
R437	1-216-053-00	METAL GLAZE	1.5K	5%	1/10W	
R438	1-216-037-00	METAL GLAZE	330	5%	1/10W	
R439	1-216-021-00	METAL GLAZE	68	5%	1/10W	
R440	1-216-059-00	METAL GLAZE	2.7K	5%	1/10W	
R441	1-216-067-00	METAL GLAZE	5.6K	5%	1/10W	
R442	1-216-047-00	METAL GLAZE	820	5%	1/10W	
R443	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R444	1-216-033-00	METAL GLAZE	220	5%	1/10W	
R445	1-216-081-00	METAL GLAZE	22K	5%	1/10W	
R446	1-216-085-00	METAL GLAZE	33K	5%	1/10W	
R447	1-216-031-00	METAL GLAZE	180	5%	1/10W	
R449	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R450	1-216-081-00	METAL GLAZE	22K	5%	1/10W	
R451	1-216-047-00	METAL GLAZE	820	5%	1/10W	
R452	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R453	1-216-067-00	METAL GLAZE	5.6K	5%	1/10W	
R454	1-216-067-00	METAL GLAZE	5.6K	5%	1/10W	
R455	1-216-077-00	METAL GLAZE	15K	5%	1/10W	
R456	1-216-085-00	METAL GLAZE	33K	5%	1/10W	
R457	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R458	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R459	1-216-093-00	METAL GLAZE	68K	5%	1/10W	
R460	1-216-045-00	METAL GLAZE	680	5%	1/10W	
R461	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R462	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R463	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R464	1-216-071-00	METAL GLAZE	8.2K	5%	1/10W	
R465	1-216-071-00	METAL GLAZE	8.2K	5%	1/10W	
R466	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	
R467	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W	
R468	1-216-699-11	METAL CHIP	100K	0.50%	1/10W	
R469	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	
R470	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R471	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R472	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R473	1-216-051-00	METAL GLAZE	1.2K	5%	1/10W	
R474	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R475	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R476	1-216-079-00	METAL GLAZE	18K	5%	1/10W	
R477	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R478	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	
R479	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R481	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R482	1-216-073-00	METAL GLAZE	10K	5%	1/10W	

When indicating parts by reference number, please include the board name.

VA-43

Ref.No	Part No.	Description				Remark
R483	1-216-089-00	METAL GLAZE	47K	5%	1/10W	
R484	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R485	1-216-089-00	METAL GLAZE	47K	5%	1/10W	
R486	1-216-081-00	METAL GLAZE	22K	5%	1/10W	
R487	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	
R488	1-216-063-00	METAL GLAZE	3.9K	5%	1/10W	
R489	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R490	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R491	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R492	1-216-055-00	METAL GLAZE	1.8K	5%	1/10W	
R493	1-216-077-00	METAL GLAZE	15K	5%	1/10W	
R494	1-216-033-00	METAL GLAZE	220	5%	1/10W	
R495	1-216-041-00	METAL GLAZE	470	5%	1/10W	
R496	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R497	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R498	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R499	1-216-067-00	METAL GLAZE	5.6K	5%	1/10W	
R500	1-216-047-00	METAL GLAZE	820	5%	1/10W	
R501	1-216-039-00	METAL GLAZE	390	5%	1/10W	
R502	1-216-041-00	METAL GLAZE	470	5%	1/10W	
R503	1-216-059-00	METAL GLAZE	2.7K	5%	1/10W	
R504	1-216-053-00	METAL GLAZE	1.5K	5%	1/10W	
R505	1-216-081-00	METAL GLAZE	22K	5%	1/10W	
R506	1-216-085-00	METAL GLAZE	33K	5%	1/10W	
R507	1-216-043-00	METAL GLAZE	560	5%	1/10W	
R508	1-216-041-00	METAL GLAZE	470	5%	1/10W	
R509	1-216-027-00	METAL GLAZE	120	5%	1/10W	
R510	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W	
R511	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R512	1-216-047-00	METAL GLAZE	820	5%	1/10W	
R513	1-216-037-00	METAL GLAZE	330	5%	1/10W	
R514	1-216-037-00	METAL GLAZE	330	5%	1/10W	
R515	1-216-047-00	METAL GLAZE	820	5%	1/10W	
R516	1-216-085-00	METAL GLAZE	33K	5%	1/10W	
R517	1-216-077-00	METAL GLAZE	15K	5%	1/10W	
R518	1-216-079-00	METAL GLAZE	18K	5%	1/10W	
R519	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	
R520	1-216-085-00	METAL GLAZE	33K	5%	1/10W	
R521	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R522	1-216-081-00	METAL GLAZE	22K	5%	1/10W	
R523	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R524	1-216-699-11	METAL CHIP	100K	0.50%	1/10W	
R525	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R526	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R527	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R528	1-216-021-00	METAL GLAZE	68	5%	1/10W	
R529	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W	
R531	1-216-089-00	METAL GLAZE	47K	5%	1/10W	
R532	1-216-081-00	METAL GLAZE	22K	5%	1/10W	
R533	1-216-089-00	METAL GLAZE	47K	5%	1/10W	
R535	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R536	1-216-089-00	METAL GLAZE	47K	5%	1/10W	
R537	1-216-069-00	METAL GLAZE	6.8K	5%	1/10W	

Ref.No	Part No.	Description				Remark
R538	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R539	1-216-089-00	METAL GLAZE	47K	5%	1/10W	
R540	1-216-039-00	METAL GLAZE	390	5%	1/10W	
R541	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R542	1-216-081-00	METAL GLAZE	22K	5%	1/10W	
R543	1-216-077-00	METAL GLAZE	15K	5%	1/10W	
R544	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W	
R545	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R546	1-216-063-00	METAL GLAZE	3.9K	5%	1/10W	
R547	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R548	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R549	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R550	1-216-138-00	METAL GLAZE	3.3	5%	1/8W	
R551	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	
R552	1-216-051-00	METAL GLAZE	1.2K	5%	1/10W	
R553	1-216-069-00	METAL GLAZE	6.8K	5%	1/10W	
R554	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R555	1-216-009-00	METAL GLAZE	22	5%	1/10W	
R556	1-216-089-00	METAL GLAZE	47K	5%	1/10W	
R557	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R558	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R559	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W	
R560	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R562	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R563	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R564	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R568	1-216-071-00	METAL GLAZE	8.2K	5%	1/10W	
R570	1-216-121-00	METAL GLAZE	1M	5%	1/10W	
R572	1-216-041-00	METAL GLAZE	470	5%	1/10W	
R573	1-216-043-00	METAL GLAZE	560	5%	1/10W	
R574	1-216-121-00	METAL GLAZE	1M	5%	1/10W	
R575	1-216-295-00	METAL GLAZE	0	5%	1/10W	
R576	1-216-037-00	METAL GLAZE	330	5%	1/10W	
R577	1-216-027-00	METAL GLAZE	120	5%	1/10W	
R578	1-216-051-00	METAL GLAZE	1.2K	5%	1/10W	
R579	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R580	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R581	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R582	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R584	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R585	1-216-085-00	METAL GLAZE	33K	5%	1/10W	
R586	1-216-011-00	METAL GLAZE	27	5%	1/10W	
R587	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R588	1-216-081-00	METAL GLAZE	22K	5%	1/10W	
R589	1-216-081-00	METAL GLAZE	22K	5%	1/10W	
R590	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R592	1-216-121-00	METAL GLAZE	1M	5%	1/10W	
R593	1-216-089-00	METAL GLAZE	47K	5%	1/10W	
R595	1-216-071-00	METAL GLAZE	8.2K	5%	1/10W	
R597	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R598	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R599	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R600	1-216-045-00	METAL GLAZE	680	5%	1/10W	

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description				Remark
R601	1-216-063-00	METAL GLAZE	3.9K	5%	1/10W	
R602	1-216-089-00	METAL GLAZE	47K	5%	1/10W	
R603	1-216-295-00	METAL GLAZE	0	5%	1/10W	
R604	1-216-295-00	METAL GLAZE	0	5%	1/10W	
R605	1-216-015-00	METAL GLAZE	39	5%	1/10W	
R606	1-216-015-00	METAL GLAZE	39	5%	1/10W	
R612	1-216-069-00	METAL GLAZE	6.8K	5%	1/10W	
R613	1-216-055-00	METAL GLAZE	1.8K	5%	1/10W	
R614	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R615	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R616	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R617	1-216-075-00	METAL GLAZE	12K	5%	1/10W	
R618	1-216-069-00	METAL GLAZE	6.8K	5%	1/10W	
R619	1-216-067-00	METAL GLAZE	5.6K	5%	1/10W	
R620	1-216-083-00	METAL GLAZE	27K	5%	1/10W	
R621	1-216-083-00	METAL GLAZE	27K	5%	1/10W	
R622	1-216-095-00	METAL GLAZE	82K	5%	1/10W	
R623	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W	
R624	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W	
R625	1-216-083-00	METAL GLAZE	27K	5%	1/10W	
R626	1-216-085-00	METAL GLAZE	33K	5%	1/10W	
R627	1-216-095-00	METAL GLAZE	82K	5%	1/10W	
R628	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R629	1-216-053-00	METAL GLAZE	1.5K	5%	1/10W	
R630	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R631	1-216-041-00	METAL GLAZE	470	5%	1/10W	
R632	1-216-063-00	METAL GLAZE	3.9K	5%	1/10W	
R633	1-216-295-00	METAL GLAZE	0	5%	1/10W	
R634	1-216-295-00	METAL GLAZE	0	5%	1/10W	
R635	1-216-295-00	METAL GLAZE	0	5%	1/10W	
R637	1-216-295-00	METAL GLAZE	0	5%	1/10W	
R639	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R640	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	
R641	1-216-063-00	METAL GLAZE	3.9K	5%	1/10W	

VARIABLE RESISTOR

Ref.No	Part No.	Description	Remark
RV250	1-230-873-11	RES, ADJ, METAL GLAZE 47K	
RV360	1-230-867-11	RES, ADJ, METAL GLAZE 1K	
RV361	1-230-870-11	RES, ADJ, METAL GLAZE 10K	
RV362	1-230-873-11	RES, ADJ, METAL GLAZE 47K	
RV363	1-230-868-11	RES, ADJ, METAL GLAZE 2.2K	
RV364	1-230-868-11	RES, ADJ, METAL GLAZE 2.2K	
RV365	1-230-869-11	RES, ADJ, METAL GLAZE 4.7K	
RV366	1-230-867-11	RES, ADJ, METAL GLAZE 1K	
RV367	1-230-868-11	RES, ADJ, METAL GLAZE 2.2K	
RV368	1-230-870-11	RES, ADJ, METAL GLAZE 10K	
RV369	1-230-869-11	RES, ADJ, METAL GLAZE 4.7K	
RV372	1-230-869-11	RES, ADJ, METAL GLAZE 4.7K	
RV373	1-230-873-11	RES, ADJ, METAL GLAZE 47K	
RV374	1-230-866-11	RES, ADJ, METAL GLAZE 470	

TERMINAL

Ref.No	Part No.	Description	Remark
TP364	*1-535-622-11	PIN, TERMINAL	
TP365	*1-535-622-11	PIN, TERMINAL	

CRYSTAL

Ref.No	Part No.	Description	Remark
X001	1-577-117-21	VIBRATOR, CRYSTAL (4.43MHz)	
X250	1-567-827-11	VIBRATOR, CRYSTAL	

* * *

*1-631-593-11 FD-12P BOARD (Ref.No 4,000 Series)

CONNECTOR

Ref.No	Part No.	Description	Remark
CN150	*1-566-537-11	CONNECTOR, FPC (NON ZIF) 5P	

RESISTOR

Ref.No	Part No.	Description				Remark
R150	1-216-295-00	METAL GLAZE	0	5%	1/10W	
R152	1-216-295-00	METAL GLAZE	0	5%	1/10W	
R154	1-216-295-00	METAL GLAZE	0	5%	1/10W	

SWITCH

Ref.No	Part No.	Description	Remark
S150	1-571-787-11	SWITCH, TACTILE (EDIT SEARCH +)	
S151	1-570-909-21	SWITCH, TACTIL (REFLOW TYPE) (EDIT SEARCH -)	
S152	1-570-909-21	SWITCH, TACTIL (REFLOW TYPE) (COUNT RESET)	
S153	1-570-909-21	SWITCH, TACTIL (REFLOW TYPE) (MEMORY)	
S154	1-570-909-21	SWITCH, TACTIL (REFLOW TYPE)(COLOR/MODE)	
S155	1-570-909-21	SWITCH, TACTIL (REFLOW TYPE) (ZERO MEMO)	

* * *

*1-631-594-11 EJ-9P BOARD (Ref.No 4,000 Series)

SWITCH

Ref.No	Part No.	Description	Remark
S169	1-571-102-11	SWITCH, SLIDE (EJECT)	

* * *

*1-631-595-11 FV-4P BOARD (Ref.No 4,000 Series)

CONNECTOR

Ref.No	Part No.	Description	Remark
CN160	1-566-527-11	CONNECTOR, FPC (ZIF) 11P	

SWITCH

Ref.No	Part No.	Description	Remark
S160	1-571-101-12	SWITCH, SLIDE (POWER)	
S161	1-570-909-21	SWITCH, TACTIL (REFLOW TYPE) (SLOW)	
S162	1-570-909-21	SWITCH, TACTIL (REFLOW TYPE) (FRAME)	
S163	1-570-909-21	SWITCH, TACTIL (REFLOW TYPE) (PAUSE)	
S164	1-570-909-21	SWITCH, TACTIL (REFLOW TYPE) (PLAY)	
S165	1-570-909-21	SWITCH, TACTIL (REFLOW TYPE) (FF)	
S166	1-570-909-21	SWITCH, TACTIL (REFLOW TYPE) (STOP)	
S168	1-570-909-21	SWITCH, TACTIL (REFLOW TYPE) (REW)	

When indicating parts by reference number, please include the board name.

FC-25P

Ref.No	Part No.	Description		Remark
	*A-7061-715-A	FC-25P BOARD, COMPLETE		(Ref.No 4,000 Series)
		************************		
	1-630-448-21	FC-25P BOARD		
		CAPACITOR		
C101	1-163-095-00	CERAMIC CHIP 12PF	5%	50V
C102	1-163-038-00	CERAMIC CHIP 0.1MF		25V
C103	1-135-149-21	TANTAL. CHIP 2.2MF	20%	10V
C104	1-163-038-00	CERAMIC CHIP 0.1MF		25V
C105	1-163-038-00	CERAMIC CHIP 0.1MF		25V
C106	1-163-021-00	CERAMIC CHIP 0.01MF	10%	50V
C107	1-163-021-00	CERAMIC CHIP 0.01MF	10%	50V
C108	1-162-638-11	CERAMIC CHIP 1MF		16V
C109	1-162-638-11	CERAMIC CHIP 1MF		16V
C110	1-163-021-00	CERAMIC CHIP 0.01MF	10%	50V
C111	1-163-009-11	CERAMIC CHIP 0.001MF	10%	50V
C112	1-126-151-11	ELECT 4.7MF	20%	16V
C113	1-135-149-21	TANTAL. CHIP 2.2MF	20%	10V
C114	1-163-021-00	CERAMIC CHIP 0.01MF		50V
		CONNECTOR		
CN101	*1-565-875-11	PIN, CONNECTOR (PC BOARD) 3P		
CN102	1-565-527-11	PIN, CONNECTOR (PC BOARD) 2P		
		TRIMMER		
CT101	1-141-331-11	CAP, VAR, TRIMMER (CHIP)		
		DIODE		
D101	8-719-940-45	DIODE DWA010		
		IC		
IC101	8-759-146-29	IC UPD75308GF-350-389		
IC102	8-759-946-03	IC S-8054ALR-S		
		COIL		
L101	1-410-192-51	INDUCTOR CHIP 1UH		
		DISPLAY PANEL		
ND101	1-808-704-11	DISPLAY PANEL, LIQUID CRYSTAL		
		TRANSISTOR		
Q101	8-729-905-23	TRANSISTOR 2SA1576-R		
Q102	8-729-109-42	TRANSISTOR 2SK94-X2		
Q103	8-729-902-96	TRANSISTOR FMS1		
Q104	8-729-905-15	TRANSISTOR DTC144WU		
Q105	8-729-905-12	TRANSISTOR DTA144EU		
Q106	8-729-905-35	TRANSISTOR 2SC4081-R		
Q107	8-729-920-39	TRANSISTOR IMT1US		
Q108	8-729-905-23	TRANSISTOR 2SA1576-R		
Q109	8-729-905-35	TRANSISTOR 2SC4081-R		
Q110	8-729-109-42	TRANSISTOR 2SK94-X2		

Ref.No	Part No.	Description			Remark
		RESISTOR			
R109	1-216-097-00	METAL GLAZE	100K	5%	1/10W
R110	1-216-097-00	METAL GLAZE	100K	5%	1/10W
R111	1-216-097-00	METAL GLAZE	100K	5%	1/10W
R112	1-216-097-00	METAL GLAZE	100K	5%	1/10W
R113	1-216-097-00	METAL GLAZE	100K	5%	1/10W
R114	1-216-073-00	METAL GLAZE	10K	5%	1/10W
R115	1-216-073-00	METAL GLAZE	10K	5%	1/10W
R116	1-216-073-00	METAL GLAZE	10K	5%	1/10W
R117	1-216-073-00	METAL GLAZE	10K	5%	1/10W
R118	1-216-073-00	METAL GLAZE	10K	5%	1/10W
R119	1-216-073-00	METAL GLAZE	10K	5%	1/10W
R120	1-216-025-00	METAL GLAZE	100	5%	1/10W
R121	1-216-025-00	METAL GLAZE	100	5%	1/10W
R122	1-216-025-00	METAL GLAZE	100	5%	1/10W
R123	1-216-109-00	METAL GLAZE	330K	5%	1/10W
R124	1-216-025-00	METAL GLAZE	100	5%	1/10W
R125	1-216-025-00	METAL GLAZE	100	5%	1/10W
R126	1-216-025-00	METAL GLAZE	100	5%	1/10W
R127	1-216-073-00	METAL GLAZE	10K	5%	1/10W
R128	1-216-073-00	METAL GLAZE	10K	5%	1/10W
R129	1-216-073-00	METAL GLAZE	10K	5%	1/10W
R130	1-216-073-00	METAL GLAZE	10K	5%	1/10W
R131	1-216-073-00	METAL GLAZE	10K	5%	1/10W
R132	1-216-097-00	METAL GLAZE	100K	5%	1/10W
R133	1-216-097-00	METAL GLAZE	100K	5%	1/10W
R134	1-216-097-00	METAL GLAZE	100K	5%	1/10W
R135	1-216-097-00	METAL GLAZE	100K	5%	1/10W
R136	1-216-097-00	METAL GLAZE	100K	5%	1/10W
R139	1-216-097-00	METAL GLAZE	100K	5%	1/10W
R140	1-216-097-00	METAL GLAZE	100K	5%	1/10W
R141	1-216-085-00	METAL GLAZE	33K	5%	1/10W
R142	1-216-129-00	METAL GLAZE	2.2M	5%	1/10W
R143	1-216-115-00	METAL GLAZE	560K	5%	1/10W
R144	1-216-025-00	METAL GLAZE	100	5%	1/10W
R145	1-216-105-00	METAL GLAZE	220K	5%	1/10W
R146	1-216-121-00	METAL GLAZE	1M	5%	1/10W
R147	1-216-121-00	METAL GLAZE	1M	5%	1/10W
R148	1-216-121-00	METAL GLAZE	1M	5%	1/10W
R149	1-216-121-00	METAL GLAZE	1M	5%	1/10W
R150	1-216-097-00	METAL GLAZE	100K	5%	1/10W
R151	1-216-097-00	METAL GLAZE	100K	5%	1/10W
R152	1-216-097-00	METAL GLAZE	100K	5%	1/10W
R153	1-216-097-00	METAL GLAZE	100K	5%	1/10W
R154	1-216-097-00	METAL GLAZE	100K	5%	1/10W
R155	1-216-097-00	METAL GLAZE	100K	5%	1/10W
R156	1-216-089-00	METAL GLAZE	47K	5%	1/10W
R157	1-216-025-00	METAL GLAZE	100	5%	1/10W
R158	1-216-073-00	METAL GLAZE	10K	5%	1/10W
R159	1-216-073-00	METAL GLAZE	10K	5%	1/10W
R162	1-216-099-00	METAL GLAZE	120K	5%	1/10W
R163	1-216-099-00	METAL GLAZE	120K	5%	1/10W

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description	Remark
R164	1-216-065-00	METAL GLAZE 4.7K 5% 1/10W	
R165	1-216-089-00	METAL GLAZE 47K 5% 1/10W	
R166	1-216-089-00	METAL GLAZE 47K 5% 1/10W	
R167	1-216-089-00	METAL GLAZE 47K 5% 1/10W	
R168	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R169	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R170	1-216-097-00	METAL GLAZE 100K 5% 1/10W	
R171	1-216-097-00	METAL GLAZE 100K 5% 1/10W	
R173	1-216-097-00	METAL GLAZE 100K 5% 1/10W	
R175	1-216-097-00	METAL GLAZE 100K 5% 1/10W	

SWITCH

Ref.No	Part No.	Description	Remark
S101	1-570-909-21	SWITCH, TACTIL (REFLOW TYPE)	
S102	1-570-909-21	SWITCH, TACTIL (REFLOW TYPE)	
S103	1-570-909-21	SWITCH, TACTIL (REFLOW TYPE)	
S104	1-570-909-21	SWITCH, TACTIL (REFLOW TYPE)	
S105	1-570-909-21	SWITCH, TACTIL (REFLOW TYPE)	
S106	1-570-909-21	SWITCH, TACTIL (REFLOW TYPE)	
S107	1-570-909-21	SWITCH, TACTIL (REFLOW TYPE)	
S108	1-570-909-21	SWITCH, TACTIL (REFLOW TYPE)	
S109	1-570-909-21	SWITCH, TACTIL (REFLOW TYPE)	
S110	1-570-909-21	SWITCH, TACTIL (REFLOW TYPE)	
S111	1-570-909-21	SWITCH, TACTIL (REFLOW TYPE)	
S112	1-570-909-21	SWITCH, TACTIL (REFLOW TYPE)	
S114	1-570-870-21	SWITCH, SLIDE	

CRYSTAL

Ref.No	Part No.	Description	Remark
X101	1-577-291-21	VIBRATOR, CERAMIC (WITH (C))	
X102	1-527-997-21	VIBRATOR, CRYSTAL (32.768KHz)	

****

*A-7061-716-A MC-36P BOARD, COMPLETE (Ref.No 2,000 Series)
****

CAPACITOR

Ref.No	Part No.	Description	Remark
C550	1-163-117-00	CERAMIC CHIP 100PF 5% 50V	
C551	1-163-009-11	CERAMIC CHIP 0.001MF 10% 50V	
C553	1-163-021-00	CERAMIC CHIP 0.01MF 10% 50V	
C554	1-164-004-11	CERAMIC CHIP 0.1MF 10% 25V	
C555	1-124-225-00	ELECT 100MF 20% 6.3V	
C556	1-164-004-11	CERAMIC CHIP 0.1MF 10% 25V	
C557	1-163-137-00	CERAMIC CHIP 680PF 5% 50V	
C559	1-162-638-11	CERAMIC CHIP 1MF 16V	
C560	1-163-117-00	CERAMIC CHIP 100PF 5% 50V	
C561	1-163-009-11	CERAMIC CHIP 0.001MF 10% 50V	
C562	1-124-225-00	ELECT 100MF 20% 6.3V	
C563	1-162-638-11	CERAMIC CHIP 1MF 16V	
C564	1-162-638-11	CERAMIC CHIP 1MF 16V	
C565	1-163-009-11	CERAMIC CHIP 0.001MF 10% 50V	
C566	1-163-009-11	CERAMIC CHIP 0.001MF 10% 50V	
C568	1-162-638-11	CERAMIC CHIP 1MF 16V	

CONNECTOR

Ref.No	Part No.	Description	Remark
CN550	*1-565-542-11	PIN, CONNECTOR (PC BOARD) 3P	
CN551	*1-566-758-11	PIN, CONNECTOR (PC BOARD) 3P	

DIODE

Ref.No	Part No.	Description	Remark
D551	8-719-106-43	DIODE RD9.1M-B1	

IC

Ref.No	Part No.	Description	Remark
IC550	8-759-820-51	IC LA7293M	

JACK

Ref.No	Part No.	Description	Remark
J550	1-507-921-00	JACK (MIC PLUG IN POWER)	
J551	1-563-454-11	JACK, MINIATURE (DC OUT)	

TRANSISTOR

Ref.No	Part No.	Description	Remark
Q550	8-729-109-43	TRANSISTOR 2SK94-X3	
Q551	8-729-905-35	TRANSISTOR 2SC4081-R	
Q552	8-729-905-35	TRANSISTOR 2SC4081-R	

RESISTOR

Ref.No	Part No.	Description	Remark
R550	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R551	1-216-121-00	METAL GLAZE 1M 5% 1/10W	
R552	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R553	1-216-095-00	METAL GLAZE 82K 5% 1/10W	
R554	1-216-097-00	METAL GLAZE 100K 5% 1/10W	
R555	1-216-059-00	METAL GLAZE 2.7K 5% 1/10W	
R556	1-216-063-00	METAL GLAZE 3.9K 5% 1/10W	
R557	1-216-069-00	METAL GLAZE 6.8K 5% 1/10W	
R558	1-216-295-00	METAL GLAZE 0 5% 1/10W	
R560	1-216-097-00	METAL GLAZE 100K 5% 1/10W	
R561	1-216-101-00	METAL GLAZE 150K 5% 1/10W	
R562	1-216-061-00	METAL GLAZE 3.3K 5% 1/10W	
R563	1-216-065-00	METAL GLAZE 4.7K 5% 1/10W	

SWITCH

Ref.No	Part No.	Description	Remark
S550	1-553-977-00	SWITCH, SLIDE	
S551	1-570-909-21	SWITCH, TACTIL (REFLOW TYPE)	

****

1-626-231-11 FP-118 FLEXIBLE BOARD
****

Ref.No	Part No.	Description	Remark
	1-562-879-11	CONNECTOR, CARD EDGE 19P	
	1-562-880-11	CONNECTOR, CARD EDGE 15P	

****

*1-630-456-21 DC-21P BOARD (Ref.No 1,000 Series)
****

CAPACITOR

Ref.No	Part No.	Description	Remark
C500	1-124-472-11	ELECT 470MF 20% 10V	

When indicating parts by reference number, please include the board name.

DC-21P PA-24P ZM-10P SW-111P

Ref.No	Part No.	Description	Remark
		CONNECTOR	
CN500	*1-506-483-21	PIN, CONNECTOR 4P	

****

*1-630-455-21 PA-24P BOARD (Ref.No 3,000 Series)
****

Ref.No	Part No.	Description	Remark
		DIODE	
D990	8-719-938-72	DIODE SB01-05CP	
		JACK	
J991	1-550-104-32	HOLDER, BATTERY	
		COIL	
L990	1-412-026-11	INDUCTOR CHIP 1UH	
L991	1-412-026-11	INDUCTOR CHIP 1UH	
L992	1-412-026-11	INDUCTOR CHIP 1UH	
		IC LINK	
PS990⚠	1-532-841-21	LINK, IC PRF1600 (1.6A)	
PS991⚠	1-532-841-21	LINK, IC PRF1600 (1.6A)	
		SWITCH	
S990	1-570-870-21	SWITCH, SLIDE (EDIT)	
		CONNECTOR	
W991	1-574-451-11	CABLE, FLAT (1.0MM PITCH) 5P	
W992	1-535-658-11	TERMINAL BOARD	

****

*1-630-454-21 ZM-10P BOARD (Ref.No 3,000 Series)
****

Ref.No	Part No.	Description	Remark
		SWITCH	
S970	1-571-315-11	SWITCH, KEY BOARD	
S971	1-571-315-11	SWITCH, KEY BOARD	

****

*1-630-453-21 SW-111P BOARD (Ref.No 3,000 Series)
****

Ref.No	Part No.	Description	Remark
		CONNECTOR	
CN930	*1-565-882-11	PIN, CONNECTOR (PC BOARD) 10P	
CN931	*1-566-758-11	PIN, CONNECTOR (PC BOARD) 3P	
		JACK	
J930	1-565-276-11	JACK, ULTRA SMALL 1P (REMOTE)	
J931	1-507-921-00	JACK (👂)	
		COIL	
L930	1-410-369-11	INDUCTOR CHIP 1UH	
L932	1-410-369-11	INDUCTOR CHIP 1UH	
		RESISTOR	
R910	1-216-295-00	METAL GLAZE 0 5% 1/10W	
		SWITCH	
S930	1-553-977-00	SWITCH, SLIDE (STANDBY LOCK)	
S931	1-571-838-11	SWITCH, TACTIL (START/STOP)	

****

MISCELLANEOUS
****

Ref.No	Part No.	Description	Remark
	1-464-993-11	CONVERTER, DC-DC	
	1-535-574-11	TERMINAL, SHAFT GROUND	
	*1-535-622-11	PIN, TERMINAL	
	*1-542-125-11	MICROPHONE (C-2027)	
	1-547-333-11	LENS, ZOOM (8508XA)	
	1-547-357-11	FILTER BLOCK, OPTICAL	
	1-574-462-11	CABLE, FLAT (1.0MM PITCH) 15P	
	1-626-233-11	FP-124 FLEXIBLE BOARD	
	1-807-238-11	SENSOR, DEW CONDENSATION	
✱IC600	8-752-603-56	IC ICX027BK-2	
J361	1-537-142-11	TERMINAL BOARD	
L951 ⚠	1-451-310-21	DEFLECTION YOKE (B/W)	
M902	8-835-309-01	MOTOR, DC BHF-3301C	
M903 ⚠	1-541-508-11	MOTOR, DC (LA14-323F)	
S902	1-553-226-00	SWITCH, LEAF	
V901 ⚠	1-546-065-11	CATHODE-RAY TUBE, B/W (MOIJVV47WB)	

****

ACCESSORIES AND PACKING MATERIALS
****

Part No.	Description	Remark
*3-340-514-01	BAG, PROTECTION	
*3-730-891-01	CUSHION (UPPER)	
*3-730-892-01	CUSHION (LOWER)	
*3-764-631-12	INSTRUCTION, DEW CONDENSATION	
3-786-986-41	MANUAL, INSTRUCTION (ENGLISH)	
3-786-986-51	MANUAL, INSTRUCTION (FRENCH/WEST GERMANY/SPANISH) (AEP, E MODEL)	
3-786-986-61	MANUAL, INSTRUCTION (NETHERLANDS/SWEDISH/ITALIAN) (AEP MODEL)	
3-786-986-71	MANUAL, INSTRUCTION (ARABIC) (E MODEL)	

✱For replacement of CCD imager read carefully the CAUTIONS FOR REPLACEMENT OF CCD IMAGER on page 91.

When indicating parts by reference number, please include the board name.

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

Ref.No	Part No.	Description	Remark

ACCESSORIES AND PACKING MATERIALS (KIT)

Ref.No	Part No.	Description	Remark
	*A-6767-706-A	RFU ADAPTOR (RFU-89EA) (AEP)	
	*A-6767-707-A	RF UNIT (RFU-89EA) (UK, E)	
	*A-6767-772-A	RF UNIT (RFU-ASA) (AUS)	
	1-559-354-11	CORD, CONNETION (USE FOR AC ADPATER)	
	3-786-154-11	MANUAL, INSTRUCTION (USE FOR AC ADPATER)	
	**	AC ADAPTOR (AC-V30)	
	***	BATTERY PACK	

Note

** MARK PARTS IS AVAILABLE FOR REPAIR SERVICE.
*** MARK PARTS IS AVAILABLE AS AN OPTIONAL ACCESSORY.

****

HARDWARE LIST
****

SCREW

Part No.	Description
7-621-255-15	SCREW +P 2X3
7-621-255-45	SCREW +P 2X6
7-621-281-15	SCREW +P 2X2
7-621-772-00	SCREW +B 2X3
7-627-850-17	SCREW, PRECISION +P 1.4X2.5
7-627-552-07	SCREW, PRECISION +P 1.7X2.5
7-627-852-18	SCREW, PRECISION +P 1.7X4 TYPE3
7-627-852-38	SCREW, PRECISION +P1.7X1.8TYPE3
7-627-553-37	PRECISION SCREW +P 2X3 TYPE 3
7-685-104-19	SCREW +P 2X6 TYPE2 NON-SLIT
7-685-105-19	SCREW +P 2X8 TYPE2 NON-SLIT
7-685-203-19	SCREW +KTP 2X5 TYPE2 NON-SLIT

STOP RING

Part No.	Description
7-624-101-01	STOP RING 1.2 (E TYPE)
7-624-102-04	STOP RING 1.5, TYPE -E

TAPPING

Part No.	Description
7-685-105-19	TPG +P 2X8, TYPE 2, NON-SLIT

****

When indicating parts by reference number, please include the board name.

CCD-F500E

SONY®
SERVICE MANUAL

AEP Model
UK Model
Australian Model
E Model

SUPPLEMENT-1

Adjustment

File this supplement with the Service Manual.

- **For Mechanical Block Adjustment.**
  For the adjustment and checking of mechanical units and the method of replacing mechanical parts not described in this Service Manual, refer to the separately supplied "8mm Video Mechanical Unit Adjustment Manual Type III (O' Mechanism)".

- When adjustment the mechanical unit by removing the camera unit, disconnect the connector according to "Precaution for Adjustment" (Page 25) described in "SECTION 3. Electrical Adjustment" and then supply 6.5±0.1Vdc to the battery terminal from the stabilized power supply.

TABLE OF CONTENTS

Section *Title* *Page*

1. CAMERA BLOCK ADJUSTMENT

1-1. List of Servicing Jigs 3
1-2. Preparations 4
1-3. Cautions 5
1-4. Camera System Adjustment 6
  1-4-1. Flange Back Adjustment 6
  1-4-2. DC-DC Converter Voltage Check 7
  1-4-3. Voltage Adjustment 7
  1-4-4. PLL Adjustment 7
  1-4-5. IRIS Set Adjustment 8
  1-4-6. AGC Set Adjustment 8
  1-4-7. Matrix Adjustment (1) 9
  1-4-8. Matrix Adjustment (2) 9
  1-4-9. Matrix Adjustment (3) 9
  1-4-10. Y_H Level Adjustment 9
  1-4-11. Chroma Level Adjustment 10
  1-4-12. Brust Level Adjustment 10
  1-4-13. Burst HUE Adjustment 10
  1-4-14. Pre-white Balance Adjustment (1) 11
  1-4-15. Pre-white Balance Adjustment (2) 11
  1-4-16. Color Reproducibility Adjustment (Using vectorscope) 11
  1-4-17. Color Reproducibility Adjustment (Using Oscilloscope) 12
  1-4-18. SET UP Adjustment 12
  1-4-19. SYNC Level Adjustment 13
  1-4-20. White Clip Adjustment 13
  1-4-21. Y Level Adjustment 13
  1-4-22. Aperture Adjustment 14
  1-4-23. Max Gain Adjustment 14
  1-4-24. Automatic White Balance Adjustment 14
  1-4-25. Automatic White Balance Check 15
  1-4-26. Backlight Correction Check 15
1-5. Auto Focus Adjustment 15
  1-5-1. AF Measurement Distance Adjustment 15
1-6. Digital Titler Block Adjustment 16
  1-6-1. AD Converter Level Adjustment 16
  1-6-2. Chroma Blanking Level Adjustment 16
  1-6-3. Y Level of Titler Adjustment 16
  1-6-4. PLL Error Voltage Adjustment 16
1-7. Adjusting Parts Location Diagram 18

2. MECHANICAL SYSTEM ADJUSTMENT

2-1. How to Disassemble Lens Unit 21
  2-1-1. How to Remove Camera Frame 21
  2-1-2. How to Remove AF Board 21
  2-1-3. How to Remove Focus Motor and Zoom Motor 21
  2-1-4. How to Remove AF Block 22
  2-1-5. How to Remove Relay Lens Cylinder Unit 22
  2-1-6. How to Remove IRIS Motor 22
  2-1-7. How to Remove IRIS Blades 23
  2-1-8. How to Remove Zoom Ring 23
  2-1-9. How to Mount Zoom Ring 23
2-2. LS CAM Plate Adjustment Procedure 24

Section *Title* *Page*

3. ELECTRICAL ADJUSTMENT

3-1. Power Supply Check 32
  3-1-1. VA 5V Voltage Check 32
3-2. System Control Adjustment 32
  3-2-1. Battery Down Adjustment 32
  3-2-2. Clock Accuracy Check 32
3-3. Servo System Adjustment 33
  3-3-1. Switching Position Adjustment 33
3-4. Video Block Adjustment 33
  3-4-1. Playback Frequency Response Adjustment 34
  3-4-2. Flying Erase Check 34
  3-4-3. Y/C Separation Adjustment 34
  3-4-4. IR2 Adjustment 35
  3-4-5. Emphasis Input Level Adjustment 35
  3-4-6. Video Out Level Adjustment 35
  3-4-7. PB Y Level Adjustment 36
  3-4-8. Y FM Carrier Frequency Adjustment 36
  3-4-9. Y FM Deviation Adjustment 36
  3-4-10. Chroma Emphasis fo Adjustment 37
  3-4-11. AFM TRAP Adjustment 37
  3-4-12. PB Y De-Emphasis Level Adjustment 38
  3-4-13. Feed Back Chroma Adjustment 38
  3-4-14. Chroma DL Gain Adjustment 38
  3-4-15. HUE Phase Deviation Adjustment (Use a Vectorscope) 39
  3-4-16. HUE Phase Deviation Adjustment (Use a Oscilloscope) 39
  3-4-17. REC Y Recording Current Adjustment 40
  3-4-18. REC C Recording Current Adjustment 40
  3-4-19. REC ATF Recording Current Check 40
  3-4-20. REC AFM Recording Current Check 40
  3-4-21. EVF Display Position Adjustment 40
  3-4-22. ATF Error Offset Adjustment 41
3-5. Audio System Adjustment 41
  3-5-1. E-E Output Level Check 41
  3-5-2. Overall Level Characteristics Check 41
  3-5-3. Overall Distortion Factor Check 42
  3-5-4. Overall Noise Level Check 42
3-6. Electronic Viewfinder System Adjustment 42
  3-6-1. Horizontality/Inclination Adjustment 42
  3-6-2. Centering Adjustment 43
  3-6-3. AFC Adjustment 43
  3-6-4. Horizontal Amplitude Adjustment 43
  3-6-5. Vertical Amplitude Adjustment 44
  3-6-6. Brightness /Contrast Adjustment 44
  3-6-7. Focus Adjustment 44
  3-6-8. Horizontal Amplitude and Vertical Amplitude Check 44
3-7. Adjusting Parts Location Diagram 46

SECTION 1
CAMERA BLOCK ADJUSTMENT

See the adjusting part location diagram from on page 18 for the adjustment.

PRE-ADJUSTMENT PREPARATIONS (CAMERA BLOCK)

1-1. LIST OF SERVICING JIGS

- Oscilloscope
- AC pack
- Adjust screw driver
- L-Shaped wrench
- Stop watch
- Color monitor
- Vectorscope

Ref. No.	Name	Part No.	Use
J-1	Filter (C22)	J-6080-829-A	Automatic white balance check
	Filter (for fine weather)	J-6080-058-A	Pre-white balance adjustment (2)
J-2	ND filter 0.4	J-6080-806-A	IRIS set adjustment, LLA adjustment
	ND filter 0.1	J-6080-807-A	IRIS set adjustment, LLA adjustment
	ND filter 1.0	J-6080-808-A	MAX. gain adjustment, LLA adjustment (use 2 pcs)
J-3	Pattern box PTB-500 * 1	J-6029-140-A	
J-4	Color chart for pattern box	J-6020-250-A	
J-5	Flat extension cable (15P)	J-6082-019-A	Use 1 pce
J-6	Extension cable (7P)	J-6080-917-A	Use 1 pce
	Extension cable (4P)	J-6082-042-A	Use 1 pce
	Extension cable (7P)	J-6080-886-A	Use 1 pce
	Extension cable K (2P)	J-6080-873-A	Use 1 pce
	Extension cable (3P)	J-6082-041-A	Use 1 pce
	Extension cable (5P)	J-6082-043-A	Use 1 pce
J-7	Lens fixing jig	J-6080-894-A	
J-8	Siemens-star	J-6080-875-A	Flange back adjustment
J-9	Sign chart	J-6080-876-A	

* 1 PTB-100 (J-6020-490-A) can also be used.

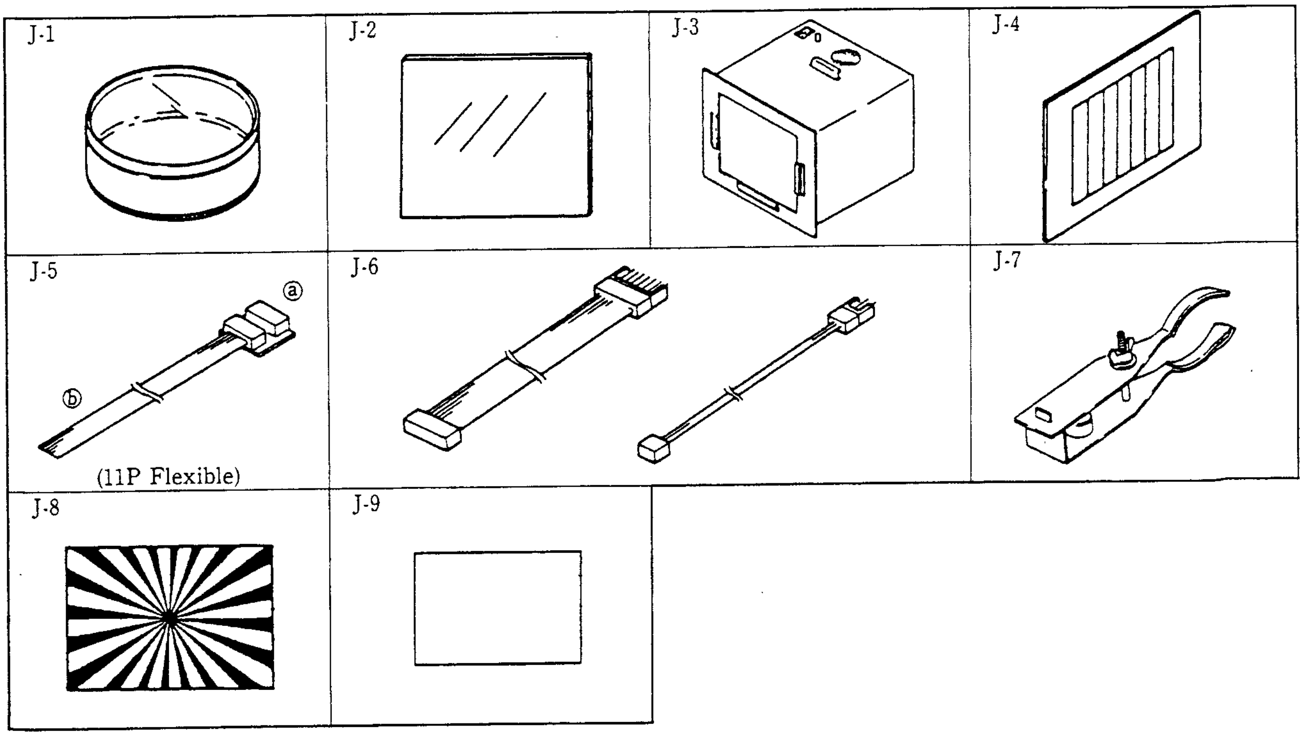


Fig. 1-1.

1-2. PREPARATIONS

Note: For more details regarding how to remove the cover and individual boards, refer to the Service Manual "1 Disassembly" of main unit.

1) Remove the camera cover, VTR panel and cabinets (left and right.)
2) Separate the camera unit from the video unit.
3) Open the camera board and fix the camera fixing jig by referring to the Service Manual, Main Unin, "2 Disassembly and 2-5. Removal of VC-61P board to VC-63P board" (Refer to Fig. 1-2).
4) Since the video block should be connected for the adjustment and checking, connect the extension cable as shown in Fig. 1-3.

Note 1: In this case, EVF (Electric View Finder) should also be connected to VA-43 board CN360.

Note 2: When the oscilloscope is used for the measurement and unless specified otherwise, EXT TRIG terminal and VC-63P terminal CN705 ⑧ pin (ID) should be connected for the synchronization.

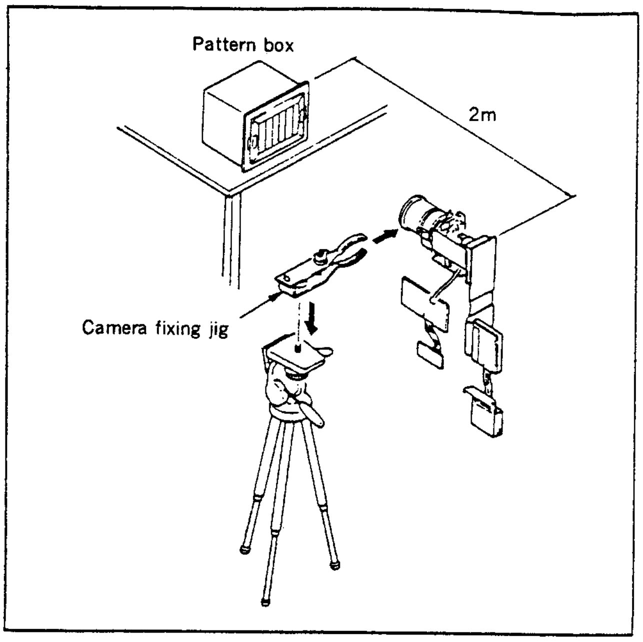

Pattern box
2m
Camera fixing jig

Fig. 1-2.

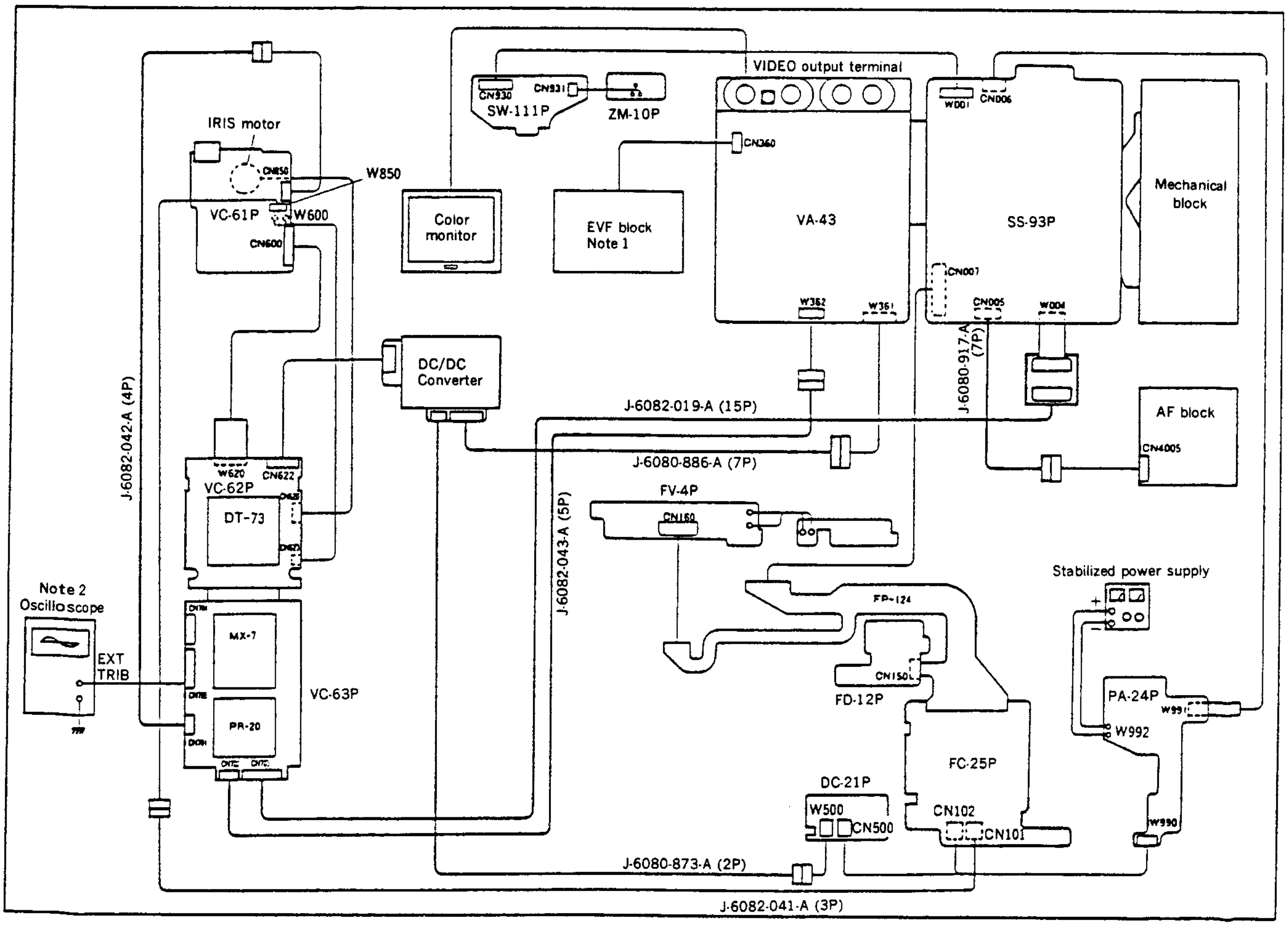

IRIS motor
CN850
W850
VC-61P
W600
CN600
CN930
CN931
SW-111P
ZM-10P
Color monitor
EVF block
Note 1
VIDEO output terminal
CN360
VA-43
W362
W361
W001
CN006
SS-93P
CN007
CN005
W004
Mechanical block
J-6082-042-A (4P)
DC/DC Converter
J-6082-019-A (15P)
J-6080-917-A (7P)
AF block
CN4005
W620
CN622
VC-62P
DT-73
J-6080-886-A (7P)
FV-4P
CN160
J-6082-043-A (5P)
Note 2
Oscilloscope
EXT
TRIB
MX-7
PR-20
VC-63P
FP-124
CN150
FD-12P
Stabilized power supply
+
−
PA-24P
W991
W992
FC-25P
DC-21P
W500
CN500
CN102
CN101
W990
J-6080-873-A (2P)
J-6082-041-A (3P)

Fig. 1-3.

1-3. CAUTIONS

1) Setting switches (only when the video unit is connected). Unless specified otherwise, set the switches to the following positons for adjustments;
   1. AUTO LOCK switch (FC-25P board S114)
      ......Manual (Lower side).

2) Adjusting sequence
   In principle, follow the indicated sequence.

3) Subjects
   1. Color bar chart (standard picture frame).
      When the color bar chart is used for the adjustment, adjust the picture frame as shown in Fig 1-4 (standard picture frame).

Color bar chart standard picture frame

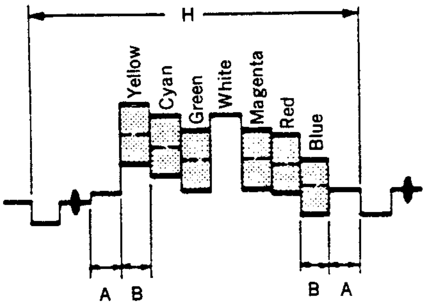

H
Yellow
Cyan
Green
White
Magenta
Red
Blue
A B
B A
A=B

Fig. a [VA-43 board J361 (Video output) waveform]

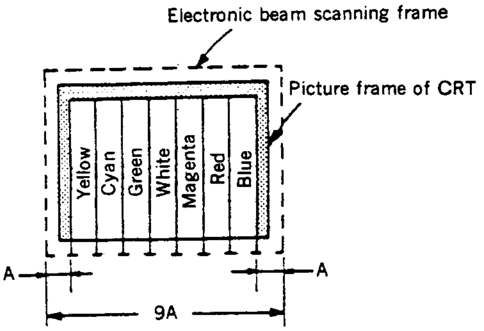

Electronic beam scanning frame
Picture frame of CRT
Yellow
Cyan
Green
White
Magenta
Red
Blue
A
A
9A

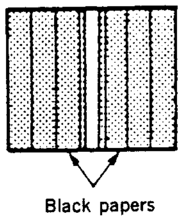
Fig. b (Picture of monitor TV)

Adjust the zooming and direction of camera in such a way that the output waveform shown in Fig. a and the monitor TV picture shown in Fig. b are obtained.

Fig. 1-4.

   2. Full white pattern
      Remove a color bar chart from the pattern box and set the zoom lever fully to the TELE side (72mm).
   3. High luminance pattern
      Prepare the high luminance pattern as shown in Fig. 1-5. and adjust the picture frame as shown in Fig. 1-6.
   4. Siemens star (J-6080-875-A)
      Adjust the camera direction is such a way that the center of Siemens star coinsides with the center of monitor screen on the monitor TV screen.

High luminance pattern


Black papers

Cover the color bar chart with block papers, except a half of the width of white stripe and then display in the standard picture frame.

Fig. 1-5.

High luminance pattern

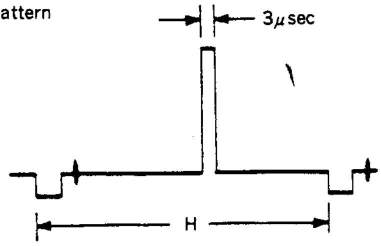


Fig. a [VA-43 board J361 (picture output) waveform]

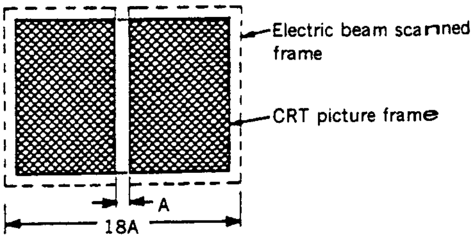

Electric beam scanned frame
CRT picture frame
A
18A

Fig. b (Picture of monitor TV)

Adjust the zooming and direction of camera until the output waveform of Fig. a and the monitor TV picture of Fig. b are displayed.

Fig. 1-6.

1-4. CAMERA SYSTEM ADJUSTMENT

1-4-1. Flange Back Adjustment

Subject	Siemens star (Position located 2 meters forward from the front of lens)
Measuring point	Checked with a monitor TV.
Measuring equipment	
Adjustment element	Adjust screw
Tools	Screw driver

[Adjustment Procedure]

1) Set AUTO LOCK SWITCH (FC-25P board S114) to "Manual" position (Lower side.)
2) Set the Siemens star at the position 2 meters forward from the front of lens.
3) Adjust the position of camera block in such a way that the center of Siemens star displayed on the monitor screen coincides with the center of monitor screen.
4) Make sure that the lens zoom lever smoothly moves to the extreme end of WIDE (8.5mm) and the extreme end of TELE (68mm) and then set the lever at the extreme end of WIDE (make sure that the zooming operation is functioning on the monitor screen at this time).
5) Open the IRIS by operating the backlight correcting switch (FC-25P board S109).
6) The end surface of "∞" side of stopper rubber should be set on the center of the 3 lines marked on the main lens cylinder (Refer to Fig. 1-7).

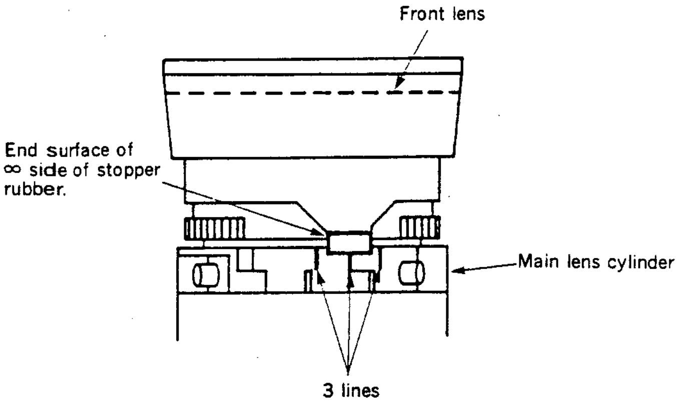


Fig. 1-7.

7) Loosen the setscrew (Refer to Fig. 1-8).
8) Insert a minus screw driver through the hole on rear lens cylinder and slightly turn the master lens frame with the edge of screw driver.
9) By turning the adjust screw, set the focus until the chart contrust becomes maximum (keep the setscrew loose at this time).
10) Readjust the focus by turning the focus ring.
11) Make sure that the ends of ∞ side of stopper rubber are kept within the range of 3 lines marked on the main lens cylinder (If not within the range, repeat the above 8) and 9)).
12) While holding the adjust screw, thus preventing it from turning, tighten the setscrew [If the position deviates, repeat the process starting from 6)] .
13) Repeat the adove 10) and 11) and check.

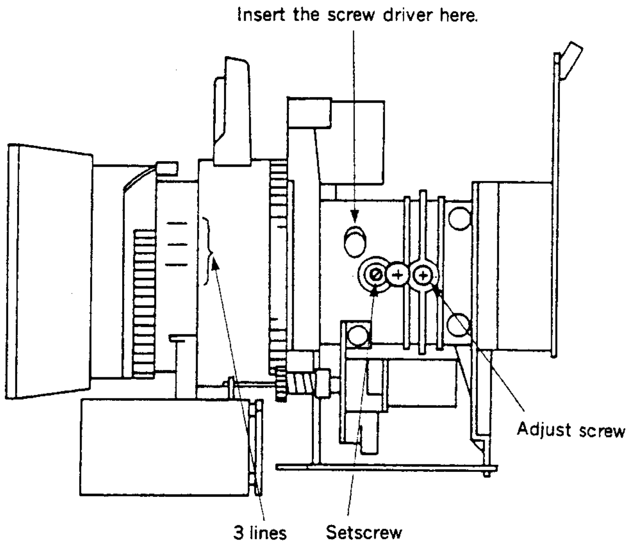


Fig. 1-8.

1-4-2. DC-DC Converter Voltage Check (VC-62P board)

Measuring equipment	Digital voltmeter
5V check	
Specified value	5.00±0.05Vdc
Measurement point	CN622 pin ①
15Vcheck	
Specified value	15.0±0.3Vdc
Measuring point	CN622 pin ④
32Vcheck	
Specified value	32.0±0.5Vdc
Measuring point	CN622 pin ⑤

Note : Connect EVF unit before checking.

[Check Procedure]

1) Make sure that each power supply voltage meets the specified value.

1-4-3. Voltage Adjustment (VC-61P board)

Subject	Arbitrary
Measurement point	CN601 pin ③
Measuring equipment	Digital voltmeter
Adjustment element	RV600
Specified value	(Imager specified voltage) ±0.05Vdc

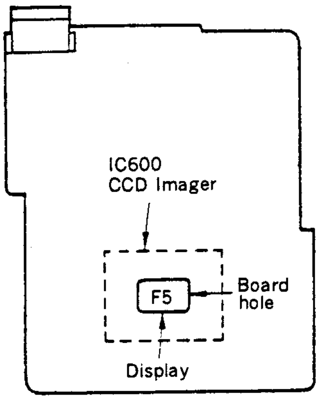
[Adjustment Procedure]

1) Set the voltage to (imager specified voltage)±0.05Vdc with RV600.

Note : V_{SUB}, specified voltage, is displayed on the imager with two digits : "integer symbol" and "decimal".

Integer Symbol	Integer Value
1	1
⋮	⋮
9	9
A	10
B	11
C	12
D	13
E	14
F	15
G	16
H	17
I	18
J	19
K	20
L	21

VC-61P BOARD (CONDUCTOR SIDE)



(EXample)
For F5 display, integer symbol is F →15, and decimal value is 5→0.5 so V_{SUB} Voltage is 15+0.5=15.5 (Vdc).

Fig. 1-9.

1-4-4. PLL Adjustment (VC-62P board)

Subject	Optional
Measurement point	See Fig. 1-10
Measurement element	Digital voltmeter
Adjustment element	CT620
Specified value	2.5±0.1Vdc

[Adjustment Procedure]

1) Adjust to 2.5±0.1Vdc with CT620.

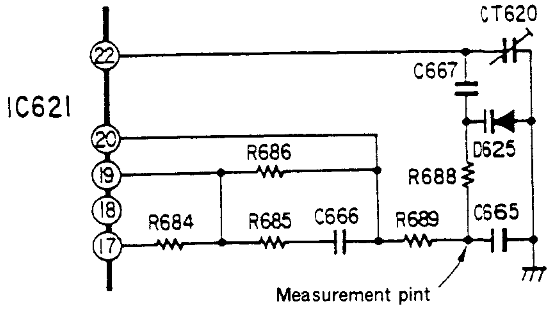


Fig. 1-10.

1-4-5. IRIS Set Adjustment (VC-62P board)

Subject	Color bar chart standard picture frame
Filter	ND filter 0.4 and 0.1
Measurement point	VC-61P board CN601 pin ① (CCD OUT)
Measurement element	Oscilloscope
Adjustment element	RV622 (IRIS)
Specified value	200±5mVp-p

[Adjustment Procedure]

1) Adjust the signal level to 200±5mVp-p with RV622. Do not use ND filter at this time.
(Be sure to complete the adjustment by turning RV622 in the direction where the level is reduced).
2) Set ND filter 0.5 (0.4+0.1) on the front of lens and make sure that the signal level changes smoothly.
3) Remove ND filter and make sure that the signal level is within 200±15mV.
4) If the specified value is not met by these adjustment, repeat the above steps, 1) to 3).

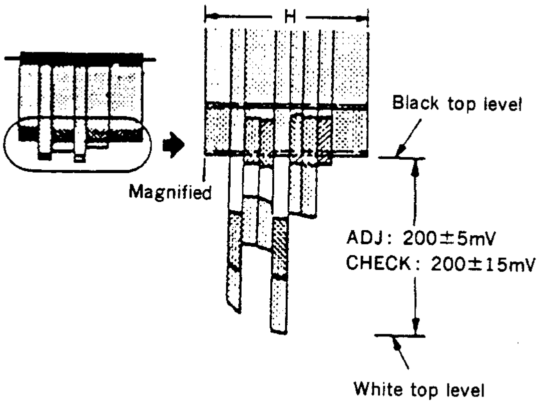

H
Magnified
Black top level
ADJ: 200±5mV
CHECK: 200±15mV
White top level

Fig. 1-11.

1-4-6. AGC Set Adjustment (VC-62P board)

Subject	Color bar chart standard picture frame
Measurement point	VC-63P board CN704 pin ①
Measuring equipment	Oscilloscope
Adjustment element	RV621
Specified value	160±5mVp-p

Note 1 : RV located next to VC-62P board should be set to the mechanical center before starting the adjusting operation.
1. RV620 (MAX GAIN)

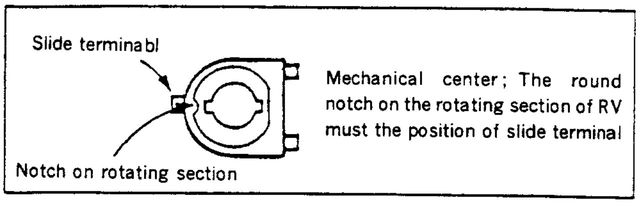

Slide terminabl
Mechanical center; The round notch on the rotating section of RV must the position of slide terminal
Notch on rotating section

Fig. 1-12.

Note 2 : When the adjustment is completed, be sure to perform "1-4-23. Max Gain Adjustment".

[Adjustment Procedure]

1) With RV621, adjust the signal level within 160±5mVp-p.

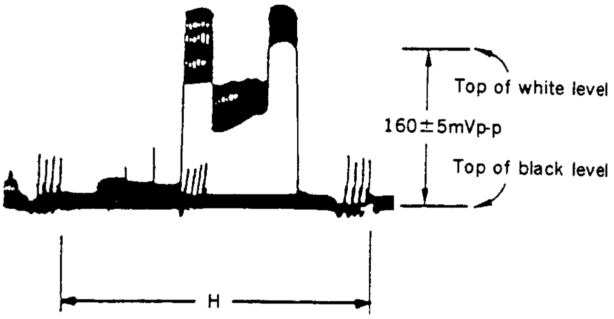


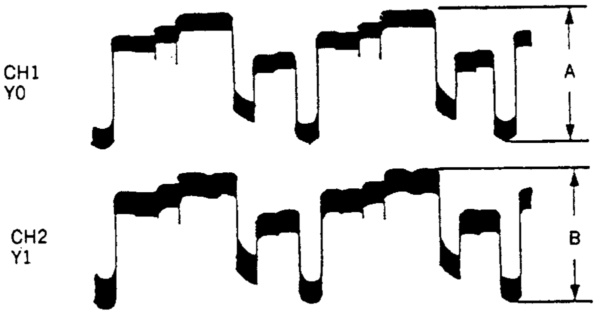
Fig. 1-13.

1-4-7. Matrix Adjustment (1) (VC-63P board)

Subject	Color bar chart standard picture frame
Measurement point	CH1 : VC-63P board CN704 pin ④ (Y_0) CH2 : VC-63P board CN704 pin ⑤ (Y_1)
Measuring equipment	Oscilloscope
Adjustment element	RV706 (Y_1 Gain)
Specified value	Levels of Y_0 and Y_1 must coincide with each other.

[Adjustment Procedure]

1) Adjust RV706 in such a way that the levels of Y_0 (CH1) and Y_1 (CH2) coincide with each other.



Adjust to A=B.

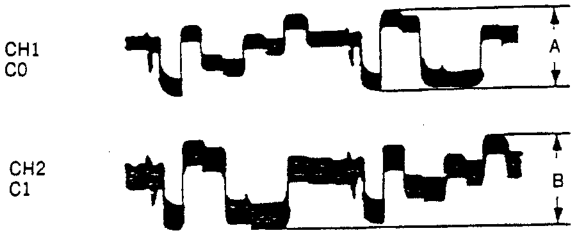
Fig. 1-14.

1-4-8. Matrix Adjustment (2) (VC-63P board)

Subject	Color bar chart standard picture frame
Measurement point	CH1 : VC-63P board CN704 pin ⑥ (C_0) CH2 : VC-63P board CN704 pin ⑦ (C_1)
Measuring equipment	Oscilloscope
Adjustment element	RV707 (C_1 GAIN)
Specified value	Levels of C_0 and C_1 must coincide with each other.

[Adjustment Procedure]

1) Adjust RV707 in such a way that the levels of C_0 (CH1) and C_1 (CH2) coincide with each other.



Adjust to A=B

Fig. 1-15.

1-4-9. Matrix Adjustment (3) (VC-63P board)

Subject	Color bar chart standard picture frame
Measurement point	CH1 (X) : PR-20 board (HIC) pin ㉑ (B-Y) CH2 (Y) : PR-20 bofrd (HIC) pin ㉒ (R-Y)
Measuring equipment	Oscilloscope (X-Y) mode
Adjustment element	RV705 (C_2 Gain)
Specified value	Minimize breaking of luminescent spot in each color.

[Adjustment Procedure]

1) Adjust RV705 in such a way that the liminous point of each color is kept within 1 point or nearly 1 point

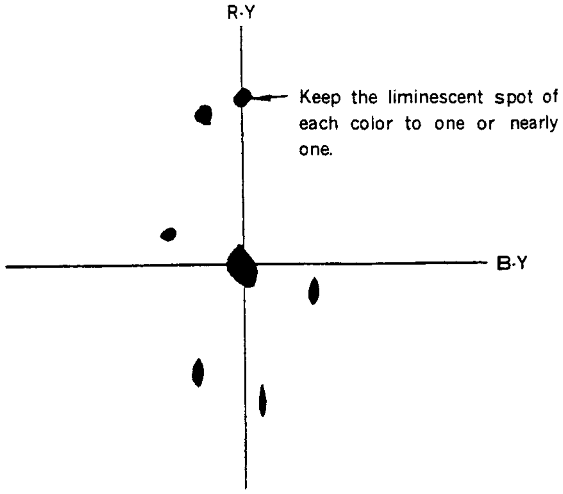

R-Y
Keep the liminescent spot of each color to one or nearly one.
B-Y

Fig. 1-16.

1-4-10. Y_H Level Adjustment (VC-63P board)

Subject	Color bar chart standard picture frame
Measurement point	CN705 pin ④ (Y_H OUT)
Measuring equipment	Oscilloscope
Adjustment element	RV701 (Y_H LEVEL)
Specified value	900±10mVp-p

[Adjustment Procedure]

1) Adjust RV701 in such a way that the white level is kept within 900±10mVp-p.

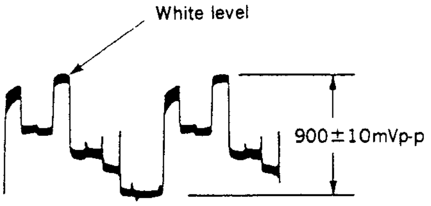


Fig. 1-17.

1-4-11. Chroma Level Adjustment (VC-63P board)

Subject	Color bar chart standard picture frame
Measurement point	CN705 pin ② (Gr/G WB)
Measuring equipment	Oscilloscope
Adjustment element	RV710 (C LEVEL)
Specified value	320±10mVp-p

[Connection]

1) Before making adjustment, VC-63P board CN705 pin ③ and GND should be short circuited with a jumper.

[Adjustment Procedure]

1) Adjust RV710 until 320±10mVp-p is obtained.
2) After the adjustment, disconnect the jumper.

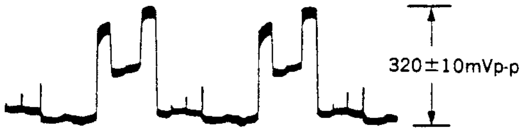


Fig. 1-18.

1-4-12. Brust Level Adjustment (VC-63P board)

Subject	All black (Cover the lens with black cap)
Measurement point	CN702 pin ①
Measuring equipment	Oscilloscope
Adjustment element	RV722
Specified value	180±5mVp-p

[Adjustment Procedure]

1) Adjust RV722 until the the brust level becomes 180±5mVp-p.

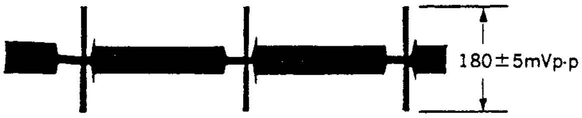


Fig. 1-19.

1-4-13. Brust HUE Adjustment (VC-63P board)

Subject	Color bar chart standard picture frame
Measurement point	VA-43 board J361 (VIDEO OUT)
Measuring equipment	Vectorscope
Adjustment element	RV721
Specified value	135±1°

[Adjustment Procedure]

1) Adjust with RV721 so that the burst phase on the vect scope becomes 135±1°

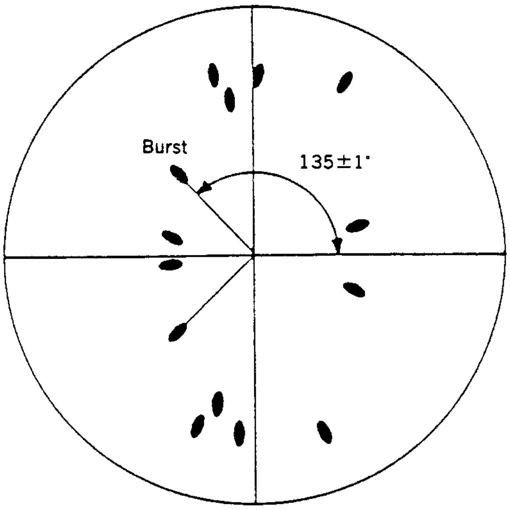


Fig. 1-20.

1-4-14. Pre-white Balance Adjustment (1) (VC-63P board)

Subject	Color bar chart standard picture frame
Measurement point	CN702 pin ①
Measuring equipment	Oscilloscope
Adjustment element	RV708 (R Gain), RV709 (B Gain)
Specified value	Minimize the carrier of white portion

[Adjustment Procedure]

1) The carrier of white portion is minimized by RV708 and RV709.

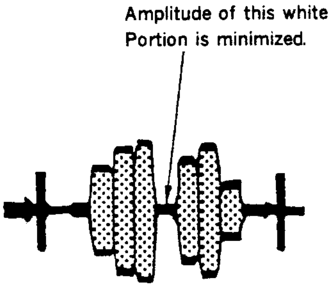


Fig. 1-21.

1-4-15. Pre-white Balance Adjustment (2) (VC-63P board)

Subject	All white pattern
Filter	Filter (for fine weather)
Measurement point	CH1 (X) : PR-20 board (HIC) pin ㉑ (B-Y) CH2 (Y) : PR-20 board (HIC) pin ㉒ (R-Y)
Measuring equipment	Oscilloscope (X-Y) mode
Adjustment element	RV725 (R CONT), RV726 (B CONT)
Specified value	Set the white luminescent spot at the center

[Adjustment Procedure]

1) Set the filter (for fine weather) and adjust RV725 and RV726 so that the white luminescent point is set at the center.

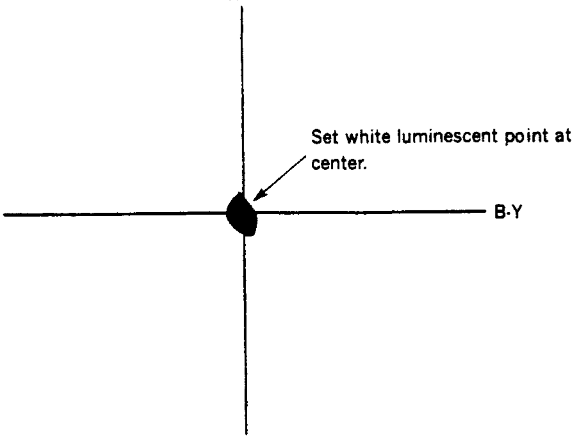


Fig. 1-22.

1-4-16. Color Reproducibility Adjustment (Using vectorscope) (VC-63P board)

Subject	Color bar chart standard picture frame
Measurement point	VA-43 board J361 (VIDEO OUT)
Measuring equipment	Vectorscope
Adjustment element	RV714 (B-Y GAIN), RV715 (R-Y GAIN) RV712 (B-Y HUE), RV713 (R-Y HUB)
Specified value	Each color's luminescent spot must be within the frame of color reproducibility. (Fig. 1-23)

[Adjustment Procedure]

1) By alternately turning RV714, RV715, RV712 and RV713, adjust the luminescent spot of each color until it is held within the frame of color reproducibility.

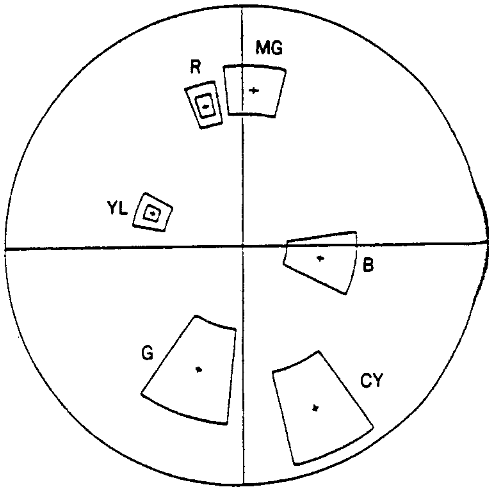
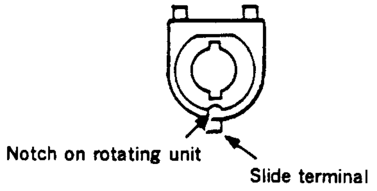


Fig. 1-23.

1-4-17. Color Reproducibility Adjustment (Using Oscilloscope)

A. Gain adjustment (VC-63P board)

Subject	Color bar chart standard picture frame
Measurement point	CN702 pin ①
Measuring equipment	Oscilloscope
Adjustment element	RV714 (B-Y GAIN), RV715 (R-Y GAIN)
Specified value	"Red" level: 340±20mVp-p "Yellow" level: 240±15mVp-p



Mechanical center; The round notch on rotating until of RV and the slide terminal must be matched at the same position.

Fig. 1-24.

[Adjustment Procedure]

1) Set RV712 (B-Y HUE) and RV713 (R-Y HUE) on the mechanical center (Refer to Fig. 1-24).
2) Adjust the amplitude of "Red" to 340±20mVp-p by RV715.
3) Adjust the amplitude of "Yellow" to 240±15mVp-p by RV714.

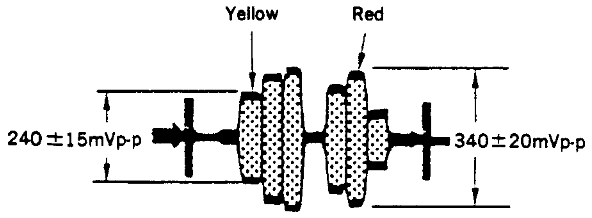


Fig. 1-25.

B. HUE Adjustment (VC-63P board)

Subject	Color bar chart standard picture frame
Measurement point	CH1 (X): PR-20 board (HIC) pin ㉑ (B-Y) CH2 (Y): PR-20 board (HIC) pin ㉒ (R-Y)
Measuring equipment	Oscilloscope (X-Y mode)
Adjustment element	RV712 (B-Y HUE), RV713 (R-Y HUE)
Specified value	Each color luminescent spot must be within the frame of color reproducibility.

[Adjustment Procedure]

1) Adjust RV712 and RV713 until the luminescent spot of R and Y_L is set within the frame of color reproducibility.

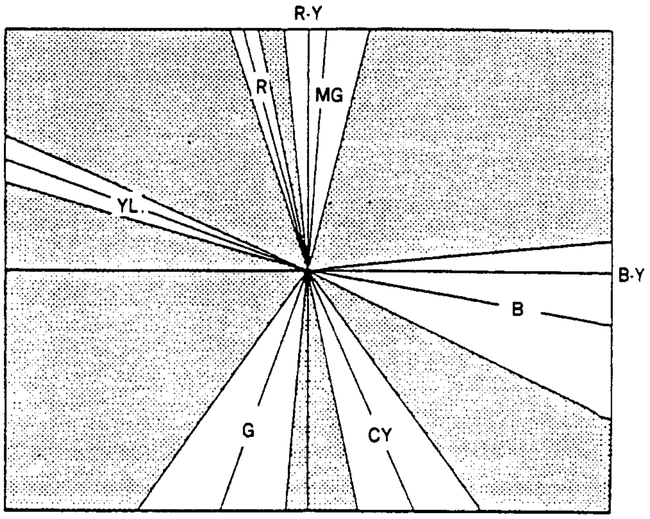


Fig. 1-26.

1-4-18. SET UP Adjustment (VC-63P board)

Subject	All black (cover the lens with black cap)
Measurement point	CN702 pin ③
Measuring equipment	Oscilloscope
Adjustment element	RV719
Specified value	30±5mVp-p

[Adjustment Procedure]

1) Adjust SET UP level to 30±5mVp-p by RV719.

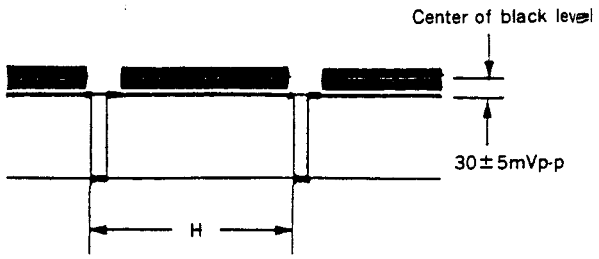


Fig. 1-27.

1-4-19. SYNC Level Adjustment (VC-63P board)

Subject	All black (Cover the lens with black cap)
Measurement point	CN702 pin ③
Measuring equipment	Oscilloscope
Adjustment element	RV720
Specified value	300±5mVp-p

[Adjustment Procedure]

1) Adjust SYNC level to 300±5mVp-p by RV720.

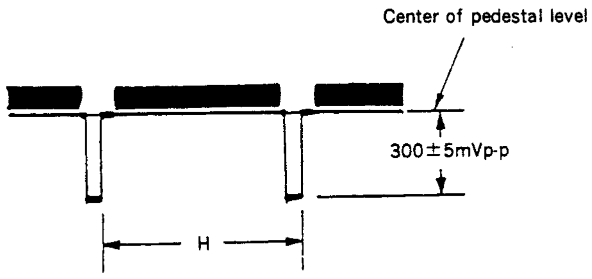

Center of pedestal level
300±5mVp-p
H

Fig. 1-28.

1-4-20. White Clip Adjustment (VC-63P board)

Subject	High luminance pattern
Measurement point	CN702 pin ③
Measuring equipment	Oscilloscope
Adjustment element	RV718
Specified value	840±20mVp-p

Note: Set RV717 as shown in Fig. 1-29.

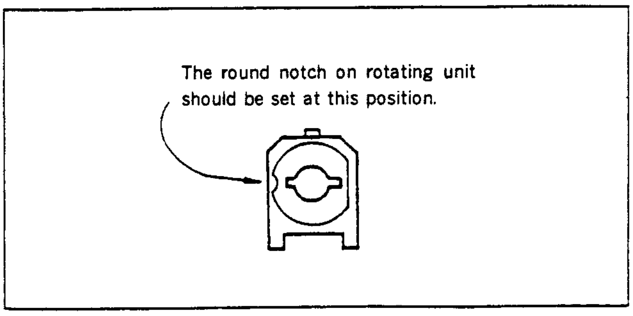

The round notch on rotating unit
should be set at this position.

Fig. 1-29.

[Adjustment Procedure]

1) Set the signal level to 840±20mVp-p by RV718.
2) Adjust the Y level.

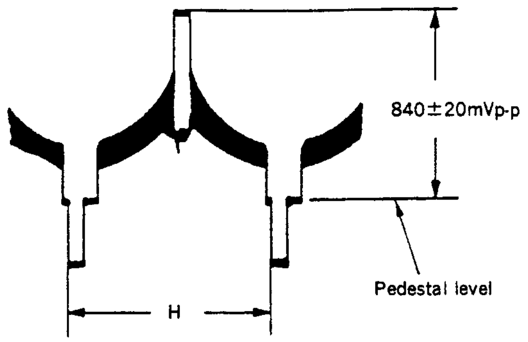

840±20mVp-p
Pedestal level
H

Fig. 1-30.

1-4-21. Y Level Adjustment (VC-63P board)

Subject	Color bar chart standard picture frame
Measurement point	CN702 pin ③ (Y OUT)
Measuring equipment	Oscilloscope
Adjustment element	RV717
Specified value	630±10mVp-p

[Adjustment Procedure]

1) Set the Y level to 630±10mVp-p by RV717.

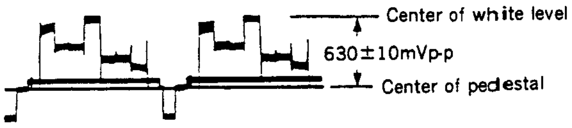

Center of white level
630±10mVp-p
Center of pedestal

Fig. 1-31.

1-4-22. Aperture Adjustment (VC-63P board)

Subject	Color bar chart standard picture frame
Measurement point	CN702 pin ③ (Y OUT)
Measuring equipment	Oscilloscope
Adjustment element	RV716
Specified value	45±5mV

[Adjustment Procedure]

1) By adjusting RV716, set the peak between "Magenta" and "White" and the center of white level to 45±5mV.

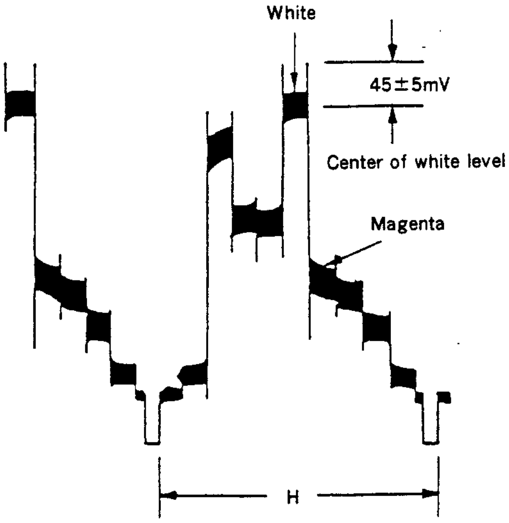


Fig. 1-32.

1-4-23. Max Gain Adjustment (VC-62P board)

Subject	Color bar chart standard picture frame
Filter	2 pcs of ND filter 1.0 and 1 pce of 0.4
Measurement point	CN702 pin ③ (VC-63P board)
Measuring equipment	Oscilloscope
Adjustment element	RV620
Specified value	330±10mVp-p

[Adjustment Procedure]

1) Set ND filter 2.4 (1.0+1.0+0.4) on the lens.
2) With RV620, adjust the gain to 330±10mVp-p

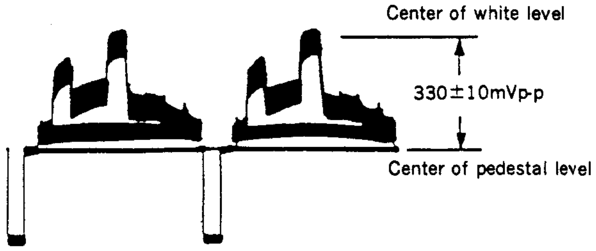


Fig. 1-33.

1-4-24. Automatic White Balance Adjustment (VC-61P board)

Subject	All white pattern * Note: 1)
Measurement point	CH1: CN850 pin ④ (R CONT) CH2: CN850 pin ③ (B CONT)
Measuring equipment	Oscilloscope (DC range)
Adjustment element	RV850

Note: 1) The white balance sensor (VC-61P board SB850) should be arranged in such a way that the light enters through the white diffusion plate. The white lens cap of conventional type camera can be used for the white diffusion plate.

2) If any light other than the light from pattern box should enter the white balance sensor, proper adjustment can not be made. It is desirous to make adjustments in a darkroom, but if it is not possible to do so, take the following steps before making the required adjustments :

1. Place the camera unit on a black paper. (This process is also necessary when making adjustments in a darkroom, etc.).
2. Adjust the distance between camera unit and pattern box to less than 0.5m (Focusing is not required.)
3. Cover the white balance sensor with a black paper, ensuring that no other light, except the light from pattern box, enters the white balance sensor.

[Connection]

Make the following connections to set the unit in the test mode ;

1) Both CN851 ① and ② pins on VC-61P board should be connected to GND with a jumper wire.

[Adjustment Procedure]

1) By turning RV850, make sure that CH1 indicates both "L" (0.5Vdc) and "H" (1.0Vdc) and CH2 indicates both "L" (1.0Vdc) and "H" (1.9Vdc).
2) Gradually turn RV850 and stop it when CH1 shows " L" (0.5Vdc) and CH2 shows "H" (1.9Vdc), respectively.

1-4-25. Automatic White Balance Check

Subject	All white pattern
Measurement point	CH1 (X) : PR-20 board (HIC) pin ㉑ (B-Y) CH2 (Y) : PR-20 board (HIC) pin ㉒ (R-Y)
Measuring equipment	Oscilloscope (X-Y) mode

[Check Procedure]

1) Make sure that the white luminescent stop is at the original point.

1-4-26. Backlight Correction Check

Subject	Color bar chart standard picture frame
Measurement point	VA-43 board J361 (Video output terminal)
Measuring equipment	Oscilloscope

[Check Procedure]

1) Push the backlight correction button (FC-25P board S109).
2) Make sure that the output level increases.

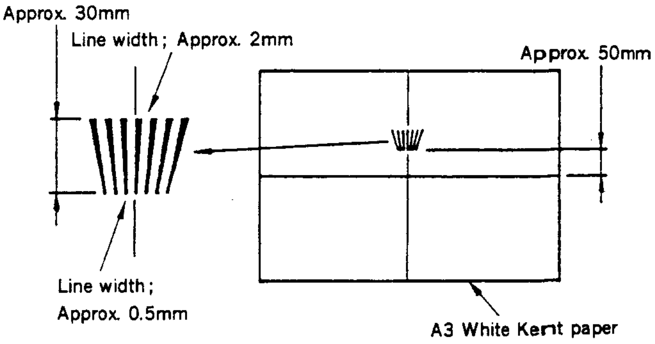
1-5. AUTO FOCUS ADJUSTMENT

1-5-1. AF Measurement Distance Adjustment

Subject	AF measurement adjust chart (Refer to Fig. 1-34)
Measurement point	Check with monitor TV.
Measuring equipment	Check with monitor TV.
Adjustment element	Measured distance adjust screw
Tool	Hexagonal wrench (1.25mm)

[Adjustment Procedure]

1) Set the chart at 2 meters forward from the front of lens.
2) Set the lens zoom lever on the TELE terminal and set the center of monitor on the center of chart.
3) Insert the hexagonal wrench into the hole located on the lower side of unit and set the focus by turning AF adjust screw (Refer to Fig. 1-35).
4) Remove the focus ring by turning it with your hand ensuring no overrunning of focus, that is, the focus is not deviated after it is properly set once when the ring is turned to ∞ side and the hand is released or when the ring is turned to 1.2m side and the hand is released.
5) When the focus overruns in the above 4), repeat the above 3) and 4).
6) Close the AF adjust hole of cabinet.



AF measuring chart

Fig. 1-34.

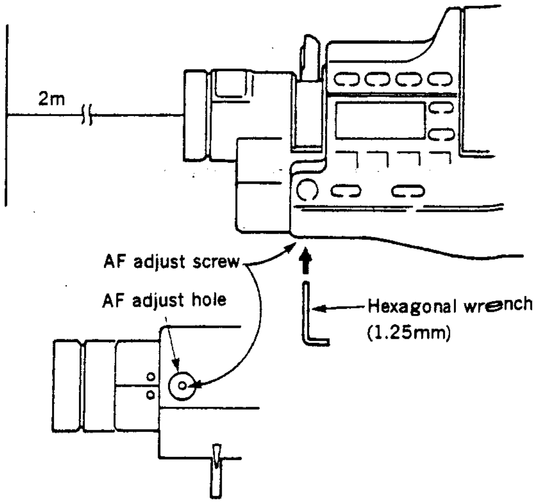


Fig. 1-35.

1-6. DIGITAL TITLER BLOCK ADJUSTMENT

1-6-1. AD Converter Level Adjustment (SS-93P board)

Mode	Camera stand-by
Subject	All black (cover the lens with black cap)
Measurement point	⊕ Probe : IC203 pin ② ⊖ Probe : IC203 pin ③
Measuring equipment	Digital voltmeter
Adjustment element	RV200
Specified value	200±5mVdc

[Adjustment Procedure]

1) Adjust the voltage to 200±5mVdc by RV200.

1-6-2. Chroma Blanking Level Adjustment (VC-63P board)

Mode	Camera stand-by
Subject	All black (cover the lens with black cap)
Measurement point	CN702 pin ①
Measuring equipment	Oscilloscope
Adjustment element	RV711
Specified value	Minimize the carrier

[Adjustment Procedure]

1) Push "Title 1" button (FC-25P board S101) or "Titl 2" button (FC-25P board S102).
2) Push "Memory" button (FD-12P board S153), thus memorizing "All black".
3) Select the white color by pushing the color button (FD-12P board S154).
4) Minimize the carrier by RV711.

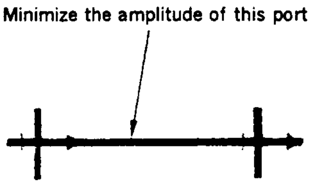


Fig. 1-36.

1-6-3. Y Level of Titler Adjustment (VC-63P board)

Mode	Camera stand-by
Subject	All black (cover the lens with black cap).
Measurement point	CN702 pin ③
Measuring equipment	Oscilloscope
Adjustment element	RV724
Specified value	570±10mVp-p

[Adjustment Procedure]

1) Push "Title 1" button (FC-25P board S101) or "Title 2" button (FC-25P board S102).
2) Push "Memory" button (FD-12P board S153), thus memorizing "All black".
3) Select the white color by pushing "color" button (FD-12P board S154).
4) By operating RV724, set the value to 570±10mVp-p.

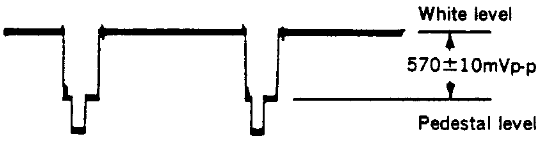


Fig. 1-37.

1-6-4. PLL Error Voltage Adjustment (SS-93P board)

Mode	Camera stand-by
Subject	Arbitrary
Measurement point	Refer to Fig. 1-38
Measuring equipment	Digital voltmeter
Adjustment element	CT200
Specified value	2.50±0.05V

[Adjustment Procedure]

1) Push "Title 1" button (FC-25P board S101).
2) Make sure that IC202 pin (64) is higher than 4.0V.
3) Push "Memory" button (FD-12P board S153).
4) By adjusting CT200, set the voltage of measured point (Refer to Fig. 1-38)

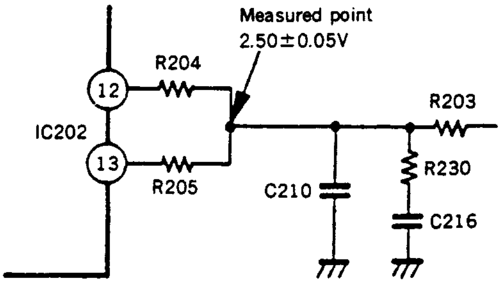
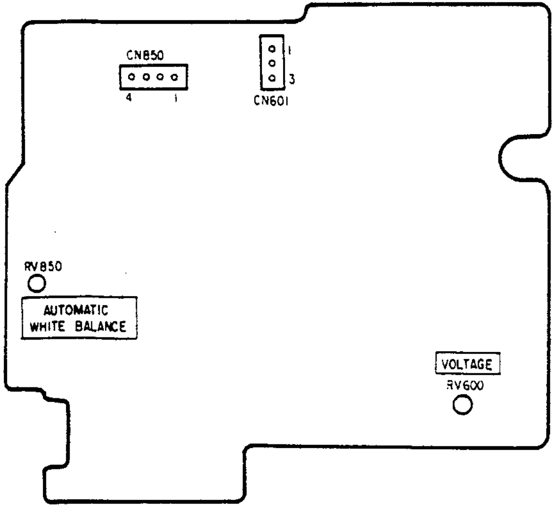


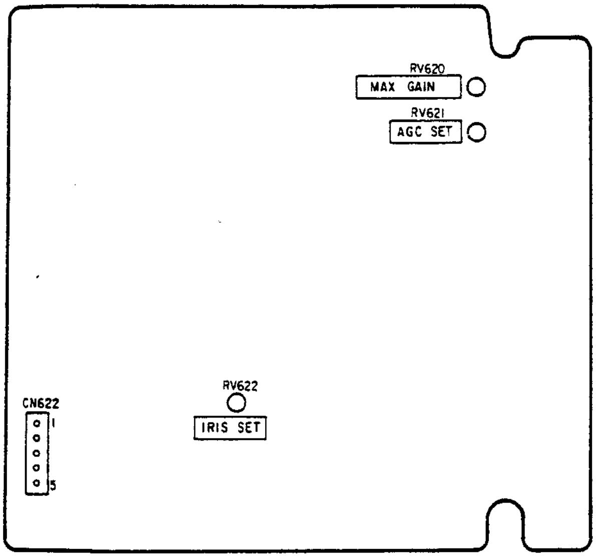
Fig. 1-38.

1-7. ADJUSTING PARTS LOCATION DIAGRAM

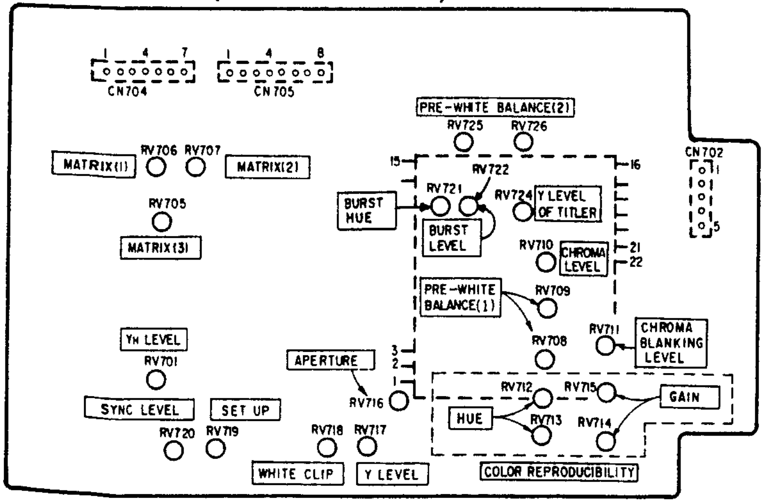
VC-61P BOARD (CONDUCTOR SIDE)


CN850
4
1
1
3
CN601
RV850
AUTOMATIC WHITE BALANCE
VOLTAGE
RV600

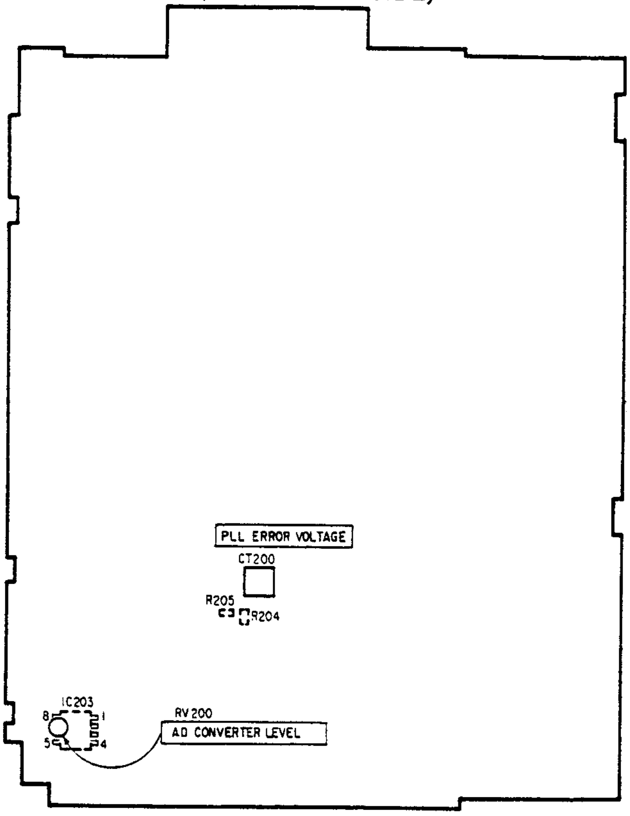
VC-62P BOARD (CONDUCTOR SIDE)


RV620
MAX GAIN
RV621
AGC SET
CN622
1
5
RV622
IRIS SET

VC-63P BOARD (CONDUCTOR SIDE)


1
4
7
CN704
1
4
8
CN705
PRE-WHITE BALANCE(2)
RV725
RV726
MATRIX(1)
RV706
RV707
MATRIX(2)
RV705
MATRIX(3)
15
16
RV722
RV721
RV724
Y LEVEL OF TITLER
BURST HUE
BURST LEVEL
RV710
CHROMA LEVEL
21
22
CN702
1
5
PRE-WHITE BALANCE(1)
RV709
RV708
RV711
CHROMA BLANKING LEVEL
YH LEVEL
RV701
APERTURE
3
2
1
RV716
RV712
RV715
GAIN
HUE
RV713
RV714
SYNC LEVEL
SET UP
RV720
RV719
RV718
RV717
WHITE CLIP
Y LEVEL
COLOR REPRODUCIBILITY

SS-93P BOARD (CONDUCTOR SIDE)


PLL ERROR VOLTAGE
CT200
R205
R204
IC203
8
1
5
4
RV200
AD CONVERTER LEVEL

SECTION 2
MECHANICAL SYSTEM ADJUSTMENT

For mechanical adjustments, refer to the separate "8mm Video Mechanical Adjustment MANUAL" (9-972-607-11)

For disassembling the cabinet and each board, refer to the Service Manual, SECTION 2 Disassembly

2-1. HOW TO DISASSEMBLE LENS UNIT

2-1-1. How to Remove Camera Frame (Refer to Fig. 2-1)

1) Remove two screws ❶ and disassemble VC shield case ❷.
2) Remove camera frame ❸.
3) Remove screw ❹ and SW board ❺.
4) Remove ❹ screws ❻ and camera frame ❼.
5) Remove AF shield plate ❽ and AF cover ❾.

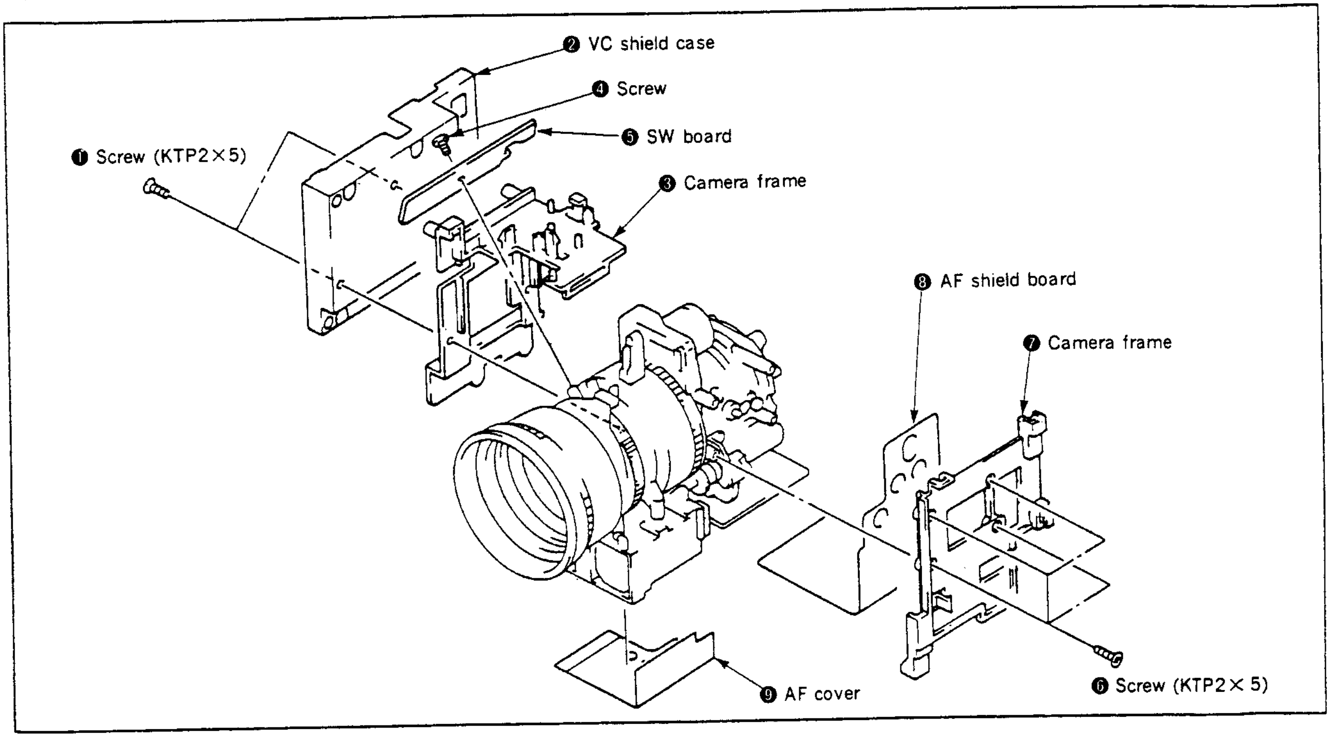

❷ VC shield case
❹ Screw
❺ SW board
❶ Screw (KTP2×5)
❸ Camera frame
❽ AF shield board
❼ Camera frame
❾ AF cover
❻ Screw (KTP2× 5)

Fig. 2-1.

2-1-2. How to Remove AF Board (Refer to Fig. 2-2)

1) Remove screw ❶ and then remove AF board ❷.
2) Remove 4 connectors ❸.

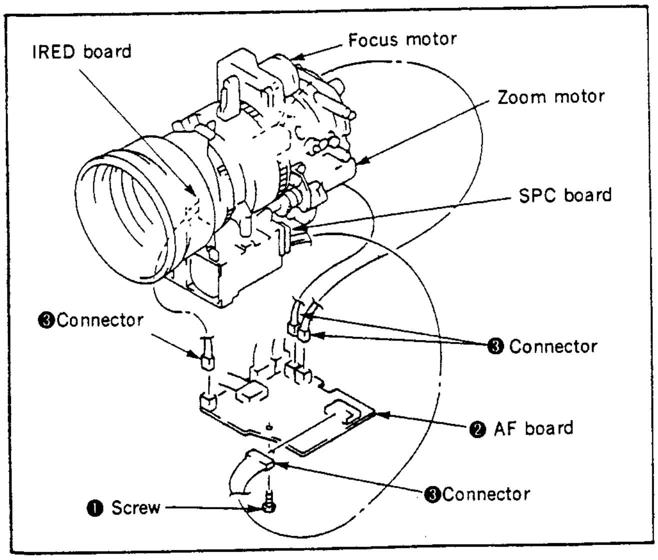

IRED board
Focus motor
Zoom motor
SPC board
❸Connector
❸ Connector
❷ AF board
❶ Screw
❸Connector

Fig. 2-2.

2-1-3. How to Remove Focus Motor and Zoom Motor (Refer to Fig. 2-3)

1) Remove screw ❶ and than remove zoom motor ❸.
2) Remove screw ❸ and then remove focus motor ❹.

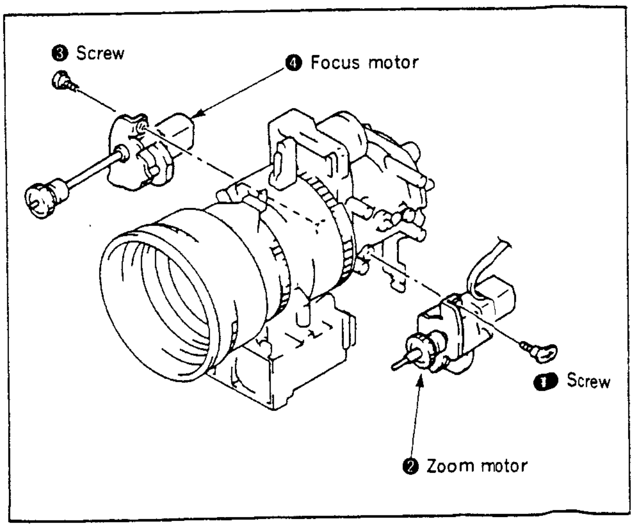

❸ Screw
❹ Focus motor
❶ Screw
❷ Zoom motor

Fig. 2-3.

2-1-4. How to Remove AF Block (Refer to Fig. 2-4)

1) Remove 2 screws ❶ and then remove AF block ❷.

Note : The screw on the IRED lens cylinder side is covered with a tape and can not be seen. Be sure to affix the tape when reassembling.

Note : When mounting AF block, make sure that the distance ring can surface ⓐ and prism arm ⓑ are properly assembled.

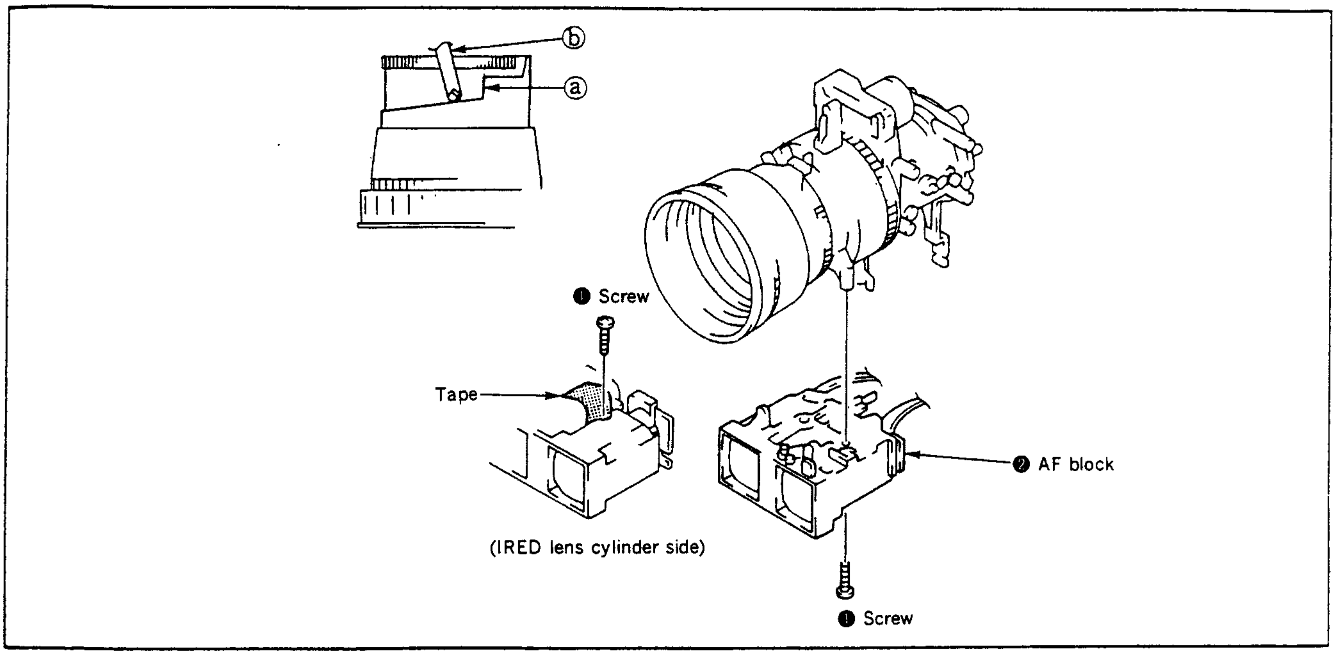

ⓑ
ⓐ
❶ Screw
Tape
❷ AF block
(IRED lens cylinder side)
❶ Screw

Fig. 2-4.

2-1-5. How to Remove Relay Lens Cylinder Unit (Refer to Fig. 2-5)

1) Remove 2 screws ❷.
2) Remove eccentric roller ❷ and then remove relay lens cylinder unit ❸.

Note : After reassembling, be sure to adjust the back focus.

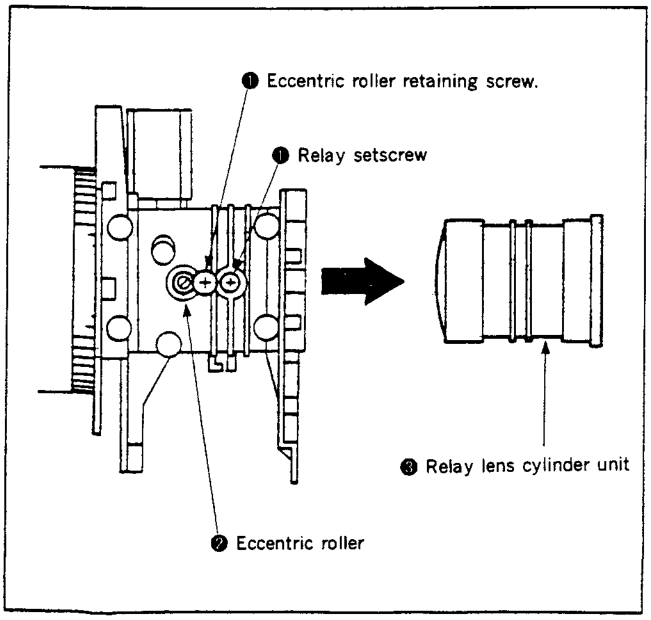

❶ Eccentric roller retaining screw.
❶ Relay setscrew
❸ Relay lens cylinder unit
❷ Eccentric roller

Fig. 2-5.

2-1-6. How to Remove IRIS Motor (Refer to Fig. 2-6)

1) Remove light shield plate ❶.
2) Remove screw ❷ and then remove IRIS motor ❸.

Note : Make sure not to deform the iris blades after removal. Iris blades are easily removed from the blade studs. keep them inserted properly
(Do not directly touch blades with hands. Use a pair of tweezers).
(Refer to 2-1-7. How to Remove Iris Blades).

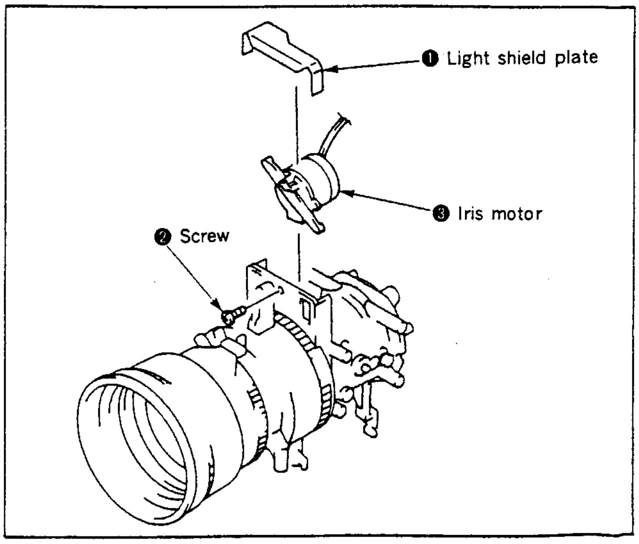

❶ Light shield plate
❸ Iris motor
❷ Screw

Fig. 2-6.

2-1-7. How to Remove Iris Blades (Refer to Fig. 2-7).

1) Remove the iris motor (Refer to 2-1-6. How to remove iris motor).
2) Set each blade stud into ⓐ section of iris blade A and remove iris blade A.
3) Remove iris blade B in the same manner.

Note : Make sure not to directly touch the blade with hands. Use a pair of tweezers.

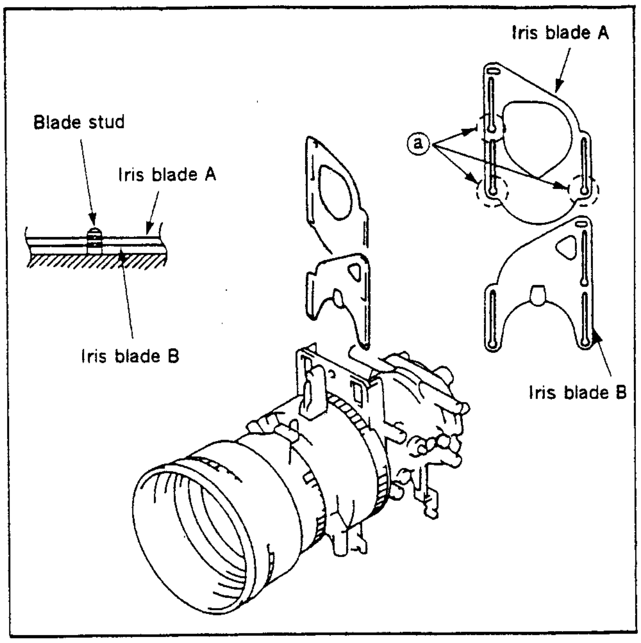

Iris blade A
Blade stud
Iris blade A
ⓐ
Iris blade B
Iris blade B

Fig. 2-7.

2-1-8. How to Remove Zoom Ring (Refer to Fig. 2-8)

1) Remove the camera frame, AF board, focus motor, zoom motor and AF block (Refer to 2-1-1~2-1-4).
2) Remove screw ❶ and then remove N stopper ❷.
3) Remove focus lens assy ❸.
4) Peel off zoom seat ❹.
5) While holding the focus side downward, remove 3 screws ❺.
6) Set the focus side upward without removing fixed lens cylinder ❻.
7) While keeping the zoom on the telescope side, remove 2 screws ❼.
8) Remove fixed lens cylinder ❻ by lifting it straight up.
9) Remove zoom ring ❽ and cam ring ❾ from the fixed lens cylinder.

2-1-9. How to Mount Zoom Ring (Refer to Fig. 2-8)

1) Set cam ring ❾ and zoom ring ❽ on fixed lens cylinder ❻.
   Note : Match a of cam ring to that of zoom ring.
2) Slowly install fixed lens cylinder ❻ from directly above.
   Note : Set ⓑ of relay holder into each positioning hole of fixed lens cylihder.
3) Set the zoom on the telescope side and tighten two screws ❼.
   Note : Move the zoom between telescope and wise angle, ensuring that the zoom moves smoothly.
4) While not removing the fixed lens cylinder and setting the focus side downward, tighten 3 screws ❺.
5) Mount focus lens assy ❸ on the fixed lens cylinder.
6) Mount N stopper ❷ and tighten screw ❶.
7) Affix zoom seat ❹.
8) Mount AF block, zoom motor, focus motor, AF board and camera frame (Refer to 2-1-1~2-1-9).
9) Check the AF measurement distance. Adjust it if deviated (Refer to 1-5-1 AF measurement distance adjustment).

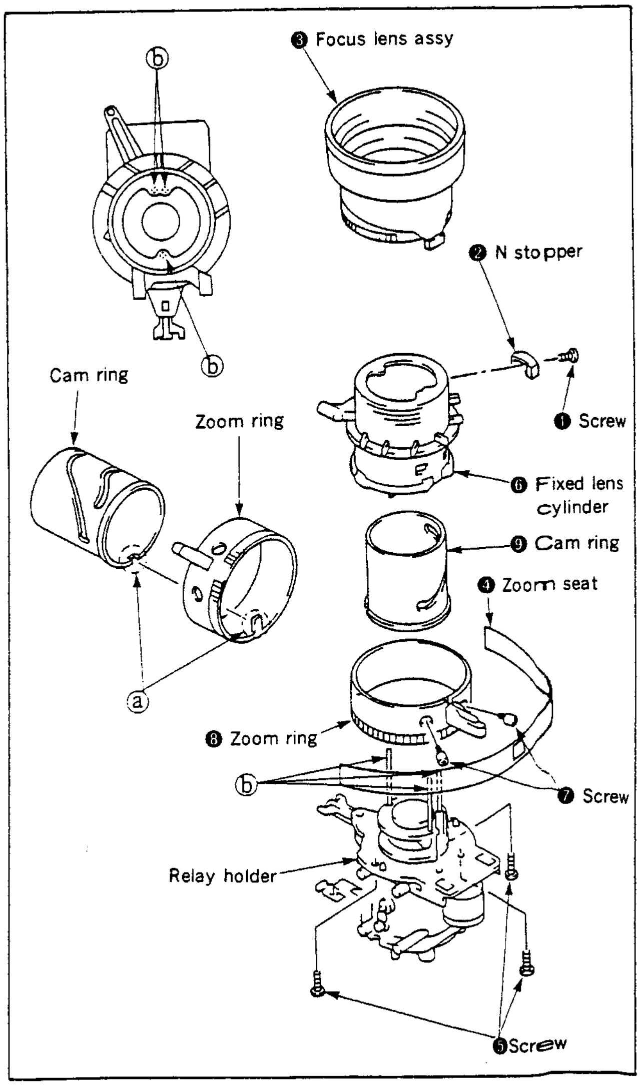

❸ Focus lens assy
ⓑ
ⓑ
❷ N stopper
Cam ring
Zoom ring
❶ Screw
❻ Fixed lens cylinder
❾ Cam ring
❹ Zoom seat
ⓐ
❽ Zoom ring
ⓑ
❼ Screw
Relay holder
❺Screw

Fig. 2-8.

2-2. LS CAM PLATE ADJUSTMENT PROCEDURE

This method is required when LS chassis, LS cam plate, mechanical chassis or LS gear C is replaced.

Note : When LS chassis, LS cam plate, mechanical chassis or LS gear is replaced, make adjustments according to the following adjust procedures ;

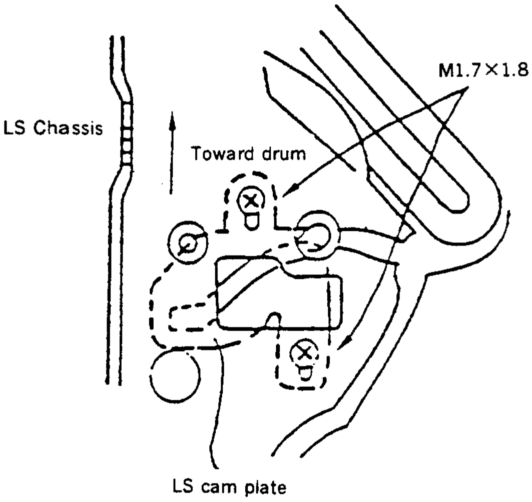
LS cam plate adjustment

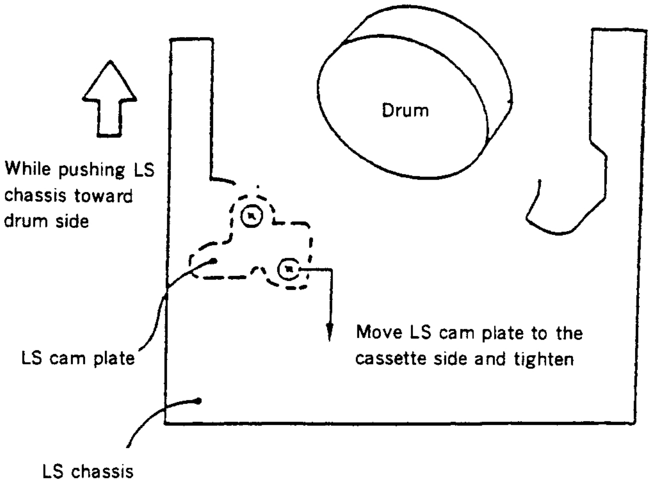
1. Temporarily set LS cam plate on the rear side of LS chassis and apply grease in the groove (set on the drum side with 2 screws, M1.7×1.8).
2. When LS chassis has been mounted on the mechanical chassis ;

❶ Loosen the two screws, M1.7×1.8

❷ and while pushing LS chassis toward the drum side,

❸ Move LS cam plate toward the set side (opposite side of drum) and tighten the screws.


M1.7×1.8
LS Chassis
Toward drum
LS cam plate


Drum
While pushing LS chassis toward drum side
Move LS cam plate to the cassette side and tighten
LS cam plate
LS chassis

SECTION 3
ELECTRICAL ADJUSTMENT

See the adjusting part location diagram from on page 46 for the adjustment.

The following measuring instruments are needed in adjusting the VTR section.

[Equipment Required]

1) Monitor TV.
2) Oscilloscope Dual-trace, Bandwidth more than 10MHz with delay mode (Use a probe of 10 : 1, unless otherwise specified.)
3) Frequency counter
4) Pattern generator with Video output terminal.
5) Digital voltmeter
6) Audio generator
7) Audio level meter
8) Audio distortion meter
9) Audio attenuator
10) Stabilized power supply
11) Alignment tapes
    For tracking adjustment (WR5-1C)
      Part number : 9-967-995-06
    For Video frequency response adjustment (WR5-6C) * 1
      Part number : 8-967-995-17
    For operation check (WR5-4CL) * 2
      Part number : 8-967-995-56
    For operation check (WR5-5CSP) * 3
      Part number : 8-967-995-47
      * 1 : WR5-2C (8-967-995-16) is also available.
      * 2 : WR5-3CL (8-967-995-36) is also available.
      * 3 : WR5-3CSP (8-967-995-46) is also available.

[Precaution for Adjustment]

Except the "Battery down adjustment" used for the adjustment of system control and the "Inside EVF indication position adjustment" used for the adjustment of VIDEO, the VIDEO unit can be adjusted by removing the camera unit. For removing the camera unit, disconnect the following 4 connectors ;

DC-DC converter must be connected to the VTR unit at this time.

1. VC-62P board CN622
2. VC-63P board CN702
3. VC-63P board CN703
4. SS-93P board CN005

EVF (Electric viewfinder) is necessary only for the "Battery down adjustment".

When removing EVF unit, disconnect the following connector :

1. VA-43 board CN360

Microphone board (MC-36 board) is not required for the adjustment of VIDEO unit. For removing the microphone board, disconnect the following connector ;

1. VA-43 board CN361

[Equipment Connection]

Unless otherwise specified, adjustment is made in the VTR mode by connecting the measuring instruments as shown in the figure below.

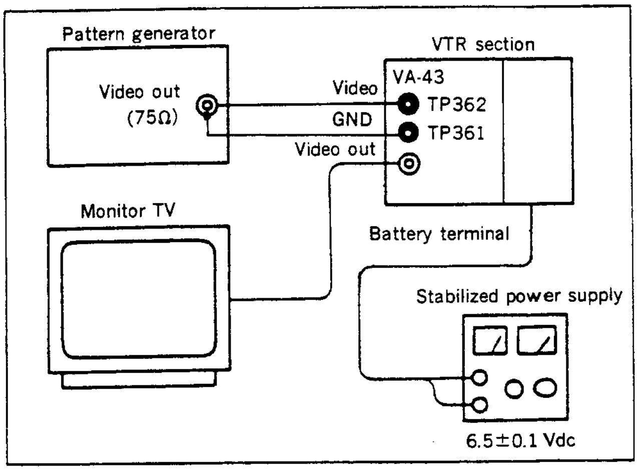


Fig. 3-1.

[Setting up for Adjustment]

Video signals output by an pattern generator are used as adjustment signals when adjusting the video section, and these video output signals should be within the required standard.

Connect an oscilloscope to TP362 (TP361 : GND) on the VA-43 board. Confirm that the amplitudes of video signal SYNC signals, of picture portions, and burst signals are flat at approximately 0.3, 0.7 and 0.3V respectively, and that the level ratio of the burst signals and "red" signals are 0.30 : 0.66. Fig. 3-2 shows video signals (color bars) used in the video section adjustments.

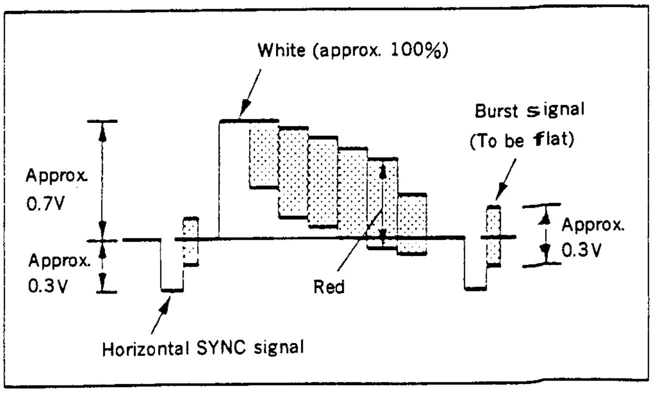
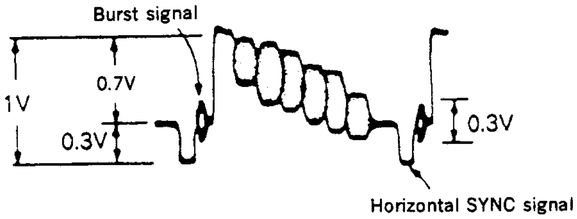


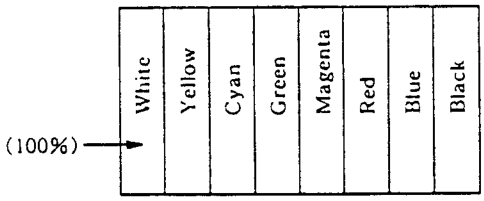
Fig. 3-2. Pattern Generator Color Bar Signals

[Alignment tape]

<table>
<tr><th>Tape</th><th>Description</th><th>Use for</th></tr>
<tr><td>Tracking
(WR5-1C)</td><td>1. Recording area : PCM—Video
2. Recording content : CH2 : 1MHz linearity adjustment signal
(CH1 : 9MHz)</td><td>Drum linearity adjustment</td></tr>
<tr><td>Video frequency Charactcristics
(WR5-6C)</td><td>1. Recording area : Video
2. Recording content : RF sweep 0 to 10MHz
3. Marker : 1, 3.58, 5.5 and 7MHz</td><td>Frequency charactcristics adjustment</td></tr>
<tr><td>Operation checking
SP mode
(WR5-5CSP)
LP mode
(WR5-4CL)

Note :
PCM area is not included in WR5-4CL</td><td>1. Recording area : Video
2. Recording content :
■ Video area
● Video signals Color bar : 4min.
Monoscope : 4min.
[Color bars]


Burst signal
1V
0.7V
0.3V
0.3V
Horizontal SYNC signal



White
Yellow
Cyan
Green
Magenta
Red
Blue
Black
(100%)

● Audio signal (AFM) 400Hz, 60% modulation
■ PCM area
● Audio signal (PCM)
1kHz, 4min. Color bar section
20Hz, 20sec.
400Hz, 20sec. } Iterative
14kHz, 20sec.</td><td>Operation checking</td></tr>
</table>

[Required level and impedance of input/output signal]

Video output	Pin jack Output signal : 1Vp-p, 75Ω unbalance, sync negative
Audio output	Pin jack Specified output : −10dBs Loading impedance : less than 10kΩ

[Service Mode]

This machine in provided with the service mode used for the adjustment and function checks.

1. STARTING SERVICE MODE

When SVP land (K IN 2 (CN160 pin ⑥) and KOUT5 (CN160 pin ⑩)) of FV-4P board are shortcircuited for more than 0.2 sec., the service mode 1 is started and all segment of LCD is turned "ON". Hereafter, whenever SVP land is shortcircuited, the mode is changed as follows;

Service mode 2
↓
Service mode 3
↓
Service mode 4
↓
Service mode 5
↓
Service mode 6
↓
Service mode 7

The service mode number is shown by the last digit of LCD (Except Service Mode 1).

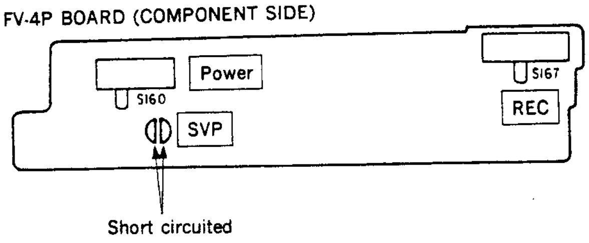

FV-4P BOARD (COMPONENT SIDE)
Power
S160
SVP
S167
REC
Short circuited

Fig. 3-3. SVP land

2. RELEASING SERVICE MODE

For releasing the service mode, set Service Mode 7 and shortcircuited SVP land, thus indicating "-- : -- : --" on LCD. Then push the date button to return to the counter display.

The service mode can also be released by turning "off" the power switch in the service mode.

3. DISPLAY ON LCD

In the service mode, except in the service mode 1, the following codes are displayed ft ①, ②, ③ and ④ on LCD (Liquid crystal display) (Refer to Fig. 3-4)

Section ①

- Service mode 2, 3
  Data of slow tracking control: Initial value BE (1F~FF)
- Service mode 4, 5
  Currently executed operation mode (Refer to Table 3-1)
- Service mode 6
  Battery level
- Service mode 7
  Key code from mode control to mechanical control.

Section ②

- Service mode 2, 3
  Data of JOG VD: Initial value 48 (1F~FF).
- Service mode 4, 5 and 6
  If there is no operation mode to be executed next (Refer to Table 3-1) or there is no new operation command, the currently executed operation mode is displayed.
- Service mode 7
  Displays the warning code for the last trouble occurred while the set is used. Memory is preserved as long as the lithium battery is functioning.

③ Warning code
When a trouble occurs, its cause is shown by one digit code (Refer to Table 3-2).
Note: Service mode 1 and 7 are not included.

④ Service mode No.
Note: Service mode 1 is not included.

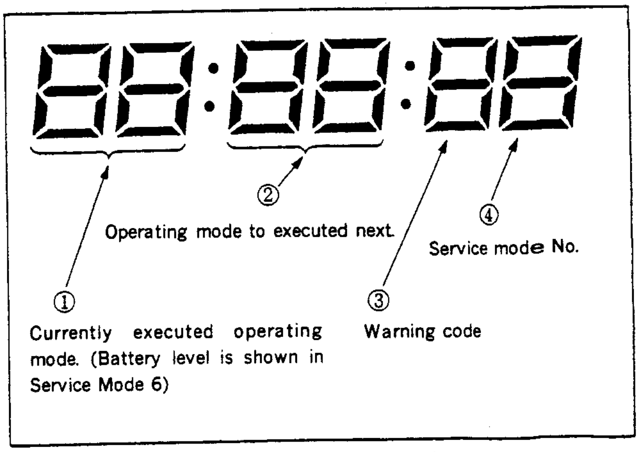

②
Operating mode to executed next
④
Service mode No.
①
Currently executed operating mode. (Battery level is shown in Service Mode 6)
③
Warning code

Fig. 3-4. Display on LCD

Table 3-1. Table of Operating Mode Codes

Code	Operating mode	Code	Operating mode	Code	Operating mode
2C	EJECT	8C	COUNTER RESET	27	FADER OFF
30	STOP	8E	MEM CNTR ON/OFF	A0	DDS SEL
32	PAUSE	B2	ZERO RETURN	A1	SHIFT
34	PB	33	CAM REC	A2	UP
36	REW	3B	INSERT	A3	SVP
38	FF	65	EDIT REV	A4	AF
3A	REC	67	EDIT CUE	A5	AWB
44	SLOW 1/10	69	REC REVIEW	A6	FADER
46	SLOW 1/5	35	TELE	A7	REC PAUSE
62	FRAME	37	WIDE	A8	BACK LIGHT
64	−X1	25	FADER ON	FF	KEY OFF CODE

Table 3-2. Table of Warning Codes

Code	Cause of stop for trouble (Trouble is detected by mechanical control, SS-93P board IC001)
0	Normal
1	Trouble with loading/unloading
2	Trouble with capstan speed (pulse is not input into IC001 ⑱ pin (CFG))
3	Trouble with capstan speed (pulse frequency of IC001 ⑱ pin (CFG) is too high).
4	Trouble with reel revolution (pulse is not input into IC001 (63) pin (T REEL FG) or (64) pin (S REEL FG)).
5	Trouble with drum revolution (pulse frequency of IC001 ⑰ pin (DFG) is too high or low).
6	Trouble with drum phase (drum is not phase locked)

4. DESCRIPTION OF EACH SERVICE MODE

[Service Mode 1]
All segments of LCD are lighted.

[Service Mode 2]
In the CAMERA mode, "><" mark is displayed at the center of lower part of monior TV picture, and "Display position in EVF can be adjusted".

[Service Mode 3]
Playback mode in which "switching position adjustment" can be made.

[Service Mode 4]
Playback mode in which "CH1' " playback frequency characteristics adjustment" can be made.

[Service Mode 5]

1) Emergency stop by the following trouble detection is prohibited.
   1. Dew detection
   2. Battery down detection
   3. Loading/unloading trouble detection
   4. Drum revolution trouble detection
   5. Drum phase trouble detection
   6. Capstan trouble (NO CFG pulse) detection
   7. Capstan trouble (CFG pulse frequency is too high) detection

[Service Mode 6]

1) "Battery down adjustment" can be made. Battery level is shown by the two digits on the left side of LCD.
2) Video system adjustment is performed in the mode when otherwise specified.

[Service Mode 7]
This is not used for this type.

Service Mode by LINCS Commander

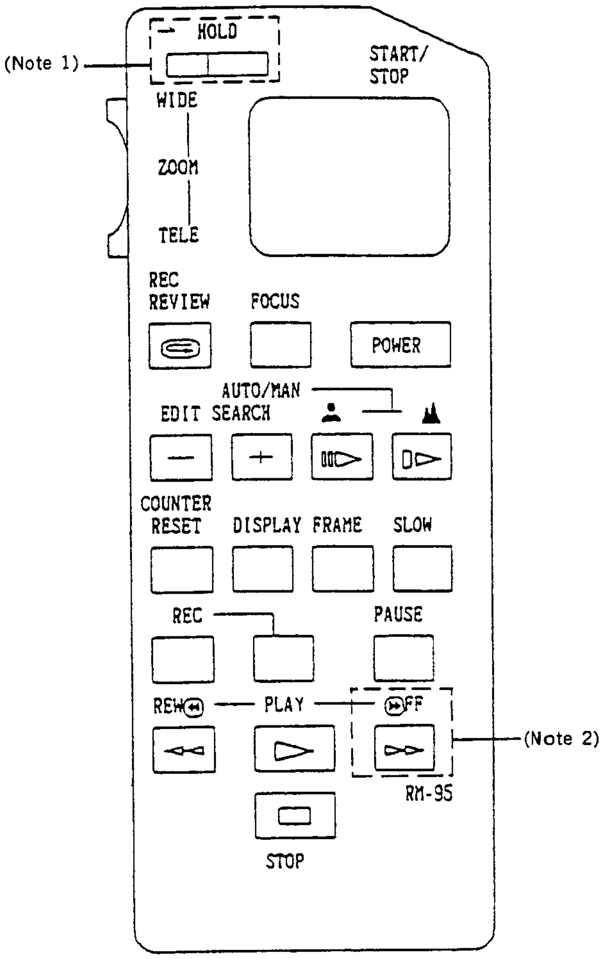
1. How to Set Service Mode

The service mode consists of two modes: ADJUST MODE which adjusts EVR and STATUS INFORMATION MODE (hereinafter called STATUS MODE) which indicates the setting status (This model: STATUS MODE only.)

The mode can be changed to STATUS MODE by connecting the service mode commander (HOLD KEY is kept on the service side).

Cf1 Service mode can be discontinued by power OFF or by advancing STATUS No., which returns to the normal mode (Service mode condition).

RM-95 (Partially modified product)


(Note 1)
HOLD
START/STOP
WIDE
ZOOM
TELE
REC REVIEW
FOCUS
POWER
AUTO/MAN
EDIT SEARCH
COUNTER RESET
DISPLAY
FRAME
SLOW
REC
PAUSE
REW
PLAY
FF
(Note 2)
RM-95
STOP

(Note 1)

Hold ON/OFF key for ordinary users serves as the NORMAL/SERVICE selector key for the service man.

(Note 2)

This key is used for advancing the FF NO. NEXT. STATUS NO.

Service Mode Display by LINCS Commander
STATUS MODE consists of the following modes;

MODE		Command display	Set display	Remarks
STATUS INFORMATION	Battery voltage	[Counter] −1 : XX : XX ⇧ ⇧ on/off Battery voltage [◀◀ ▶ ▶▶] off [Others] Same as NORMAL	⇦ Same as left	Battery voltage is the value obtained by dividing by resistance. (Refer to the next page)
	Last memo emergency	[Counter] −2 : XX : XX ⇧ ⇧ on/off Emergency No. [◀◀ ▶ ▶▶] off [Others] Same as NORMAL	⇦ Same as left	The emergency occurred last while using the set should be stored (memorized) even when the power is turned off (battery OFF). This is called LAST MEMO EMERGENCY. This machine is provided with 6 types of LAST EMERGENCIES (Refer to the next page).
	Present emergency	[Counter] −3 : XX : XX ⇧ ⇧ on/off Emergency No. [◀◀ ▶ ▶▶] off Same as NORMAL	⇦ Same as left	

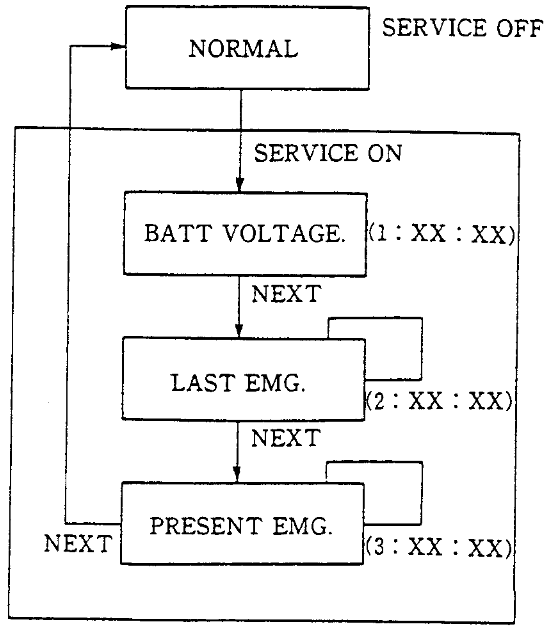
[LINCS Command]

WORD 0 B0 B7	WORD 1 B0 B7	Command name	
1 1 1 1 1 1 1 1 (Note 1)	0 0 0 1 1 1 0 0 (Note 2)	NEXT	Switches display

Note 1 : ON/OFF of service mode is decided depending on WORD 0, and therefore the service remote control continuously sends 1 1 1 1 1 1 1 1 B to WORD 0 even when commands are not sent.

Note 2 : NEXT WORD is common to the ordinary FF command.

(Service Mode (Status Display) Condition Transition Diagram) by LINCS Commander

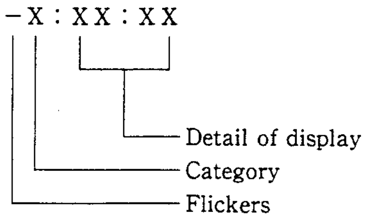

NORMAL
SERVICE OFF
SERVICE ON
BATT VOLTAGE.
(1 : XX : XX)
NEXT
LAST EMG.
(2 : XX : XX)
NEXT
PRESENT EMG.
(3 : XX : XX)
NEXT

* To turn off the service mode (NORMAL);

1. Actuate the POWER OFF slide switch.
2. Advance STATUS NO until NORMAL is returned.

Note : When all the required operations are completed, return the service mode to NORMAL.

[Display Method]


−X : XX : XX
Detail of display
Category
Flickers

Category	Detail of display
1	Result of battery voltage A/D conversion (sexadecimal indication). Same indications used when adjusting P. C. board)
2	LAST EMG. (Refer to the table below) (Note 1)
3	PRESENT EMG. (Refer to the table below) (Note 2)

Note 1 : LAST EMG. is not updated even when a trouble occurs during the service mode. Therefore, the LAST EMG. immediately before starting the service mode is stored.

[Displaying Trouble in Service Mode by LINCS Commander]

Condition of trouble	PRESENT EMG. display	LAST EMG.
No trouble	00 : 00	00 : 00
Loading/unloading trouble	00 : 01	00 : 01
No CAP FG	00 : 02	00 : 02
Trouble with CAP high speed revolution	00 : 03	00 : 03
Trouble with REEL revolution	00 : 04	00 : 04
Trouble with drum revolution (0)	00 : 05	00 : 05
Trouble with drum phase (0)	00 : 06	00 : 06

* Indicates the code which is exactly the same as the warning code in the service mode.

3-1. POWER SUPPLY CHECK

3-1-1. VA5V Voltage Check (VA-43 board)

Mode	Camera Standby
Signal	Arbitrary
Measurement point	W361 pin ②
Measuring equipment	Digital voltmeter
Specified value	5.05±0.05Vdc

[Check Procedure]

1) The voltage of W361 pin ② must meet the specified value.

3-2. SYSTEM CONTROL ADJUSTMENT

3-2-1. Battery Down Adjustment (SS-93P board)

Mode	Camera REC
Subject	Arbitrary
Measurement point	+ : BATT (+) terminal − : BATT (−) terminal
Measuring equipment	Digital voltmeter
Adjustment element	RV001
Specified value	When power voltage is 5.76±0.01Vdc and LCD displays the counter, digits of "92" are indicated.

Note 1 : A thick short lead wire should be used to connect between the stabilized power supply and the battery terminals BATT (+) and' BATT (−) of this machine.

Note 2 : Connect the camera unit and EVF unit and adjust them.

[Adjustment Procedure]

1) Set the unit is Service Mode 6 (Refer to Service Mode).
2) Make sure that the power voltage is 6.5±0.1Vdc.
3) Set the machine in the Camera REC mode.
4) Slowly lower the power voltage down to 5.76 ±0.01Vdc.
5) By operating RV001, adjust the two digits on the left side of counter of LCD to "92".

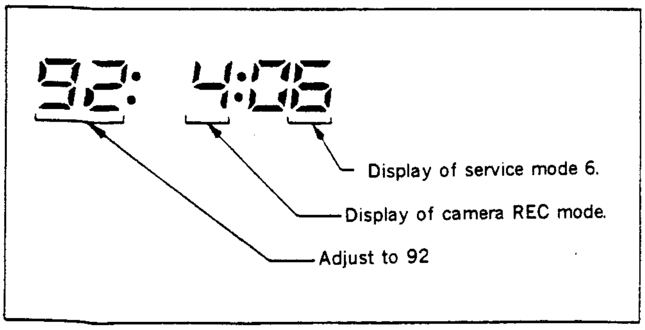


Fig. 3-5.

[Check Procedure]

1) Make sure that the machine is set in Service Mode 6.
2) Set the power voltage to 6.5±0.1Vdc.
3) Switch the power supply from OFF to ON.
4) Switch to CAMERA REC mode.
5) Slowly lower the power voltage down to 5.81±0.01Vdc.
6) Make sure that the battery down warning displayed on LCD is one of the following two ;
    1) 🔋 mark is not displayed.
    2) 🔋 mark is slowly flickering (0.8Hz).
7) Slowly lower the power voltage down to 5.71±0.01Vdc. Make sure 🔋 mark displayed on LCD is quickly flickering.
8) Release the service mode (Refer to [Service Mode]).

3-2-2. Clock Accuracy Check (FC-25P board)

Mode	E-E
Measurement point	IC101 pin ㊾
Measuring equipment	Frequency counter
Adjustment element	CT101
Specified value	2048.005±0.008Hz

[Adjustment Procedure]

1) Adjust to 2048.005+0.008Hz with CT101.

3-3. SERVO SYSTEM ADJUSTMENT

3-3-1. Switching Position Adjustment (SS-93P board)

Mode	Playback
Signal	For alignment tape tracking adjustment (WR5-1C)
Measurement point	CH1 : CN004 pin ④ (RF OUT) CH2 : IC001 pin ⑭ (RF SWP)
Measuring equipment	Oscilloscope
Adjustment element	RV002
Specified value	0±10μsec

Note : Connect pins ② and ⑧ of CN004 to GND.

[Adjustment Procedure]

1) Adjust RV002 until the marker of RF CH2 waveform coincides with the lowering part of RF SWP waveform.

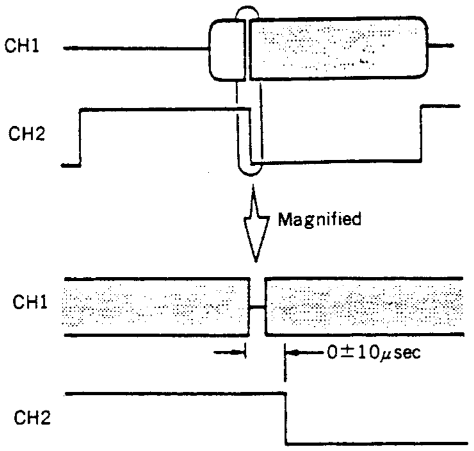


Fig. 3-6.

3-4. VIDEO BLOCK ADJUSTMENT

The adjustment of the video system should in principle be followed the undermentioned adjustment procedure.
The color video signal supplied from the pattern generator is utilized as the video input signal for the video system adjustment in recording mode. Make sure that the SYNC signal and color burst signal are matched with those the set-up of during the adjustment of as shown in Fig. 3-2.

[Adjustment Procedure]

1) Playback frequency response adjustment
2) Flying erase check
3) Y/C separation adjustment
4) IR2 adjustment
5) Emphasis input level adjustment
6) Video out level adjustment
7) PB Y level adjustment
8) Y FM carrier frequency adjustment
9) Y FM deviation adjustment
10) Chroma emphasis f_0 adjustment
11) AFM TRAP adjustment
12) PB Y De-emphasis level adjustment
13) Feed back chroma adjustment
14) Chroma DL gain adjustment
15) HUE phase deviation adjustment (use a vectorscope)
16) HUE phase deviation adjustment (use an oscilloscope)
17) REC Y recording current adjustment
18) REC C recording current adjustment
19) REC ATE recording current check
20) REC AFM recording current check
21) EVF display position adjustment
22) ATF error offset adjustment

3-4-1. Playback Frequency Response Adjustment (SS-93P board)

(1) CH1 and CH2 adjustment

CH2 adjustment is shown in [ ] .

Mode	Playback
Signal	Alignment tape for frequency response adjustment (WR5-6C)
Measurement point	Pin ④ of CN004 SS-93P board External trigger : Pin ② of CN004 in SS-93P board Trigger slope : +, [−]
Measuring instrument	Oscilloscope
Adjusting element	RV302 [RV301]
Specified value	3.58MHz level : 5.5MHz level=4 : 3

[Adjustment method]

1) Adjustment RV302 [RV301] so that the level difference ratio 3.58MHz and 5.5MHz should be 4 : 3.

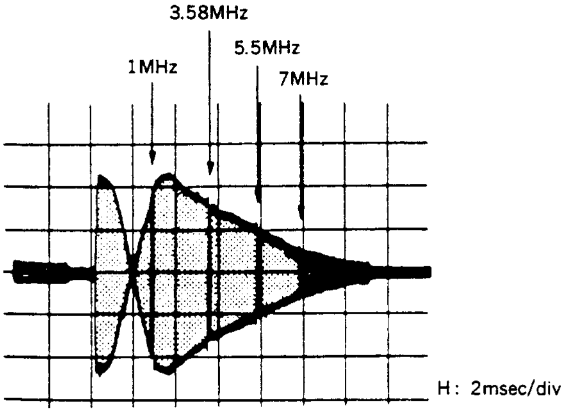


Fig. 3-7.

(2) CH1' adjustment

Mode	Playback Service mode 4*¹
Signal	Alignment tape for frequency response adjustment (WR5-2C)
Measurement point	Pin ⑤ of CN004 in SS-93P board External trigger : Pin ② of CN004 in SS-93P board Trigger slope : −
Measuring instrument	Oscilloscope
Adjustment element	RV306
Specified value	3.58MHz level : 5.5MHz level=4 : 3.3

* 1 : Make the unit to service mode 4 with reference to [Service mode] and mape sure to release it after the adjustment.

[Adjustment method]

1) Adjust RV306 so that the level difference ratio between 3.58MHz and 5.5MHz should be 4 : 3.3.

3-4-2. Flying Erase Check (SS-93P board)

Mode	Record
Signal	Arbitrary
Measurement point	Pin ⑫ of CN003 (FE (X))
Measuring instrument	Oscilloscope and frequency counter
Specified value	Frequency : more than 7.5MHz Voltage : more than 7.0Vp-p

Note : Be sure to use MP type tape.

[Checking method]

1) Confirm that the oscillation frequency is more than 7.5MHz, and the oscillation volltage is more than 7.0Vp-p.

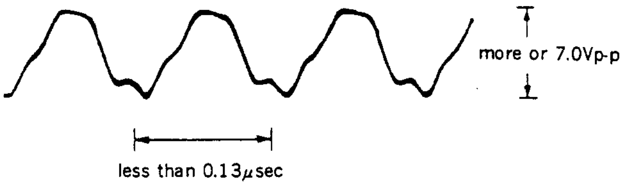


Fig. 3-8.

3-4-3. Y/C Separation Adjustment (VA-43 board)

Mode	Camera Standby (Service mode 6)
Signal	Color bar
Measurement point	IC360 pin ㉕
Measuring instrument	Oscilloscope
Adjusting element	RV361
Specified value	Minimum residual chroma component

Note : Before adjustment, connect 10μF capacitor in between IC360 pin ㊴ and ground.

[Adjustment method]

1) Adjust RV361 to minimize residual chroma component.

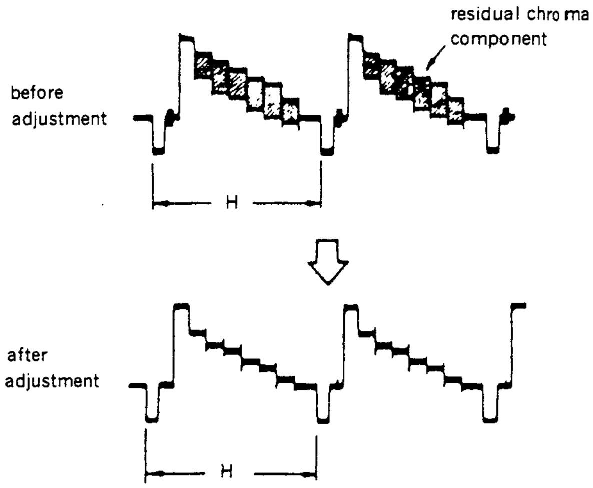


Fig. 3-9.

3-4-4. IR2 Adjustment (VA-43 board)

Mode	Camera Standby (Service mode 6)
Signal	Color bar
Measurement point	IC360 pin ⑧
Measuring instrument	Oscilloscope
Adjusting element	RV362
Specified value	6.9±0.2μsec

Note : Adjust after connecting a 10kΩ resistor between pin ⑧ and GND of IC360.

[Adjustment method]

1) Adjust RV362 for 6.9±0.2μsec.

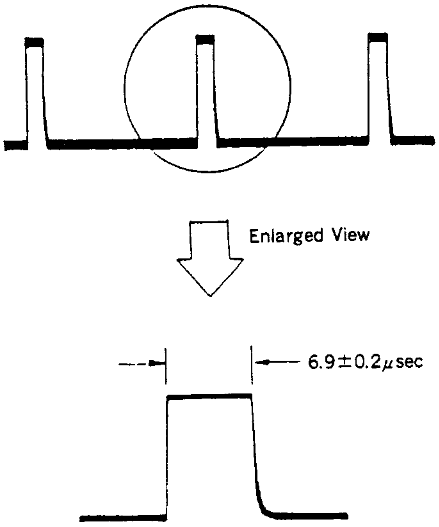


Fig. 3-10.

3-4-5. Emphasis Input Level Adjustment (VA-43 board)

Mode	Camera Standby (Service mode 6)
Signal	Color bar
Measurement point	IC360 pin (54)
Measuring instrument	Oscilloscope
Adjusting element	RV363
Specified value	0.50±0.02Vp-p

[Adjustment method]

1) Adjust RV363 for 0.50±0.02Vp-p.

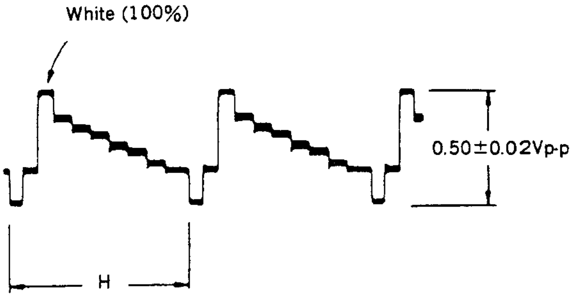


Fig. 3-11.

3-4-6. Video Out Level Adjustment (VA-43 board)

Mode	Camera Standby (Service mode 6)
Signal	Color bar
Measurement point	VA-43 board J361 (VIDEO OUT)
Measuring instrument	Oscilloscope
Adjusting element	RV373
Specified value	1.00±0.04Vp-p

Note : Be sure to terminate J361 (VIDEO OUT) at 75 ohms.

[Adjustment method]

1) Adjust RV373 on for 1.00±0.04Vp-p.

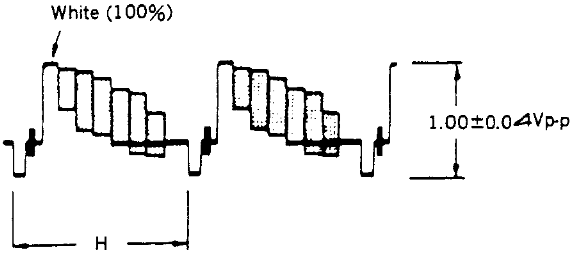


Fig. 3-12.

3-4-7. PB Y Level Adjustment (VA-43 board)

Mode	Playback
Signal	Alignment tape for operation check (WR5-5CSP), Color bar portion
Measurement point	VA-43 board J361 (VIDEO OUT)
Measuring instrument	Oscilloscope
Adjusting element	RV362
Specified value	1.00±0.04Vp-p

Note 1 : Be sure to be off (SP) the EDIT (SP/LP) switch (PA-24P board S990).

Note 2 : Be sure to teminate J361 (VIDEO OUT) at 75 ohms.

[Adjustment method]

1) Adjust RV362 for 1.00±0.04Vp-p.

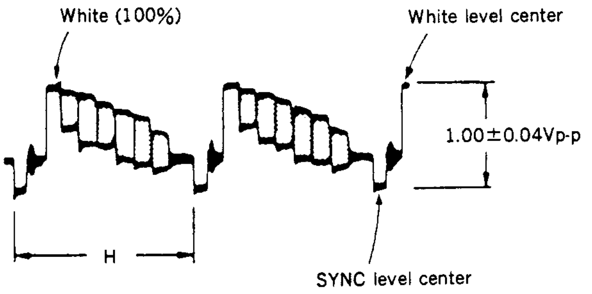


Fig. 3-13.

3-4-8. Y FM Carrier Frequency Adjustment (VA-43 board)

Mode	Camera Standby (Service mode 6)
Signal	No signal
Measurement point	IC360 Pin (59)
Measuring instrument	Frequency counter
Adjusting element	RV365
Specified value	4.20±0.04MHz

[Adjustment method]

1) Adjust RV365 for 4.20±0.04MHz
2) Perform "Y FM Deviation Adjustment".

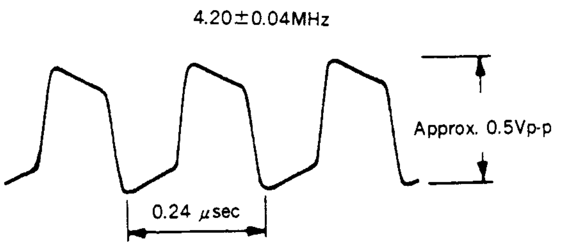


Fig. 3-14.

3-4-9. Y FM Deviation Adjustment (VA-43 board)

Mode	Record and Playback (Service mode 6)
Signal	Color bar
Measurement point	VA-43 board J361 (VIDEO OUT)
Measuring instrument	Oscilloscope
Adjusting element	RV364
Specified value	Playback level : 1.00±0.05Vp-p

Note 1 : Be sure that the "VIDEO OUT Level Adjustment", "PB Y Level Adjustment" and "Y FM Carrier Frequency Adjustment" have been already completed.

Note 2 : Be sure to be off (SP) the EDIT (SP/LP) switch (S990 on PA-24P board)

Note 3 : Be sure to terminate J361 (VIDEO OUT) at 75 ohms.

[Adjustment method]

1) Record the color bar signal.
2) Playback the section recorded by 1.)
3) Confirm that the playback output level is 1.00±0.05 Vp-p.
4) When 3) is not satisfide, adjust RV364 as follows. And then repeat the abovementioned steps 1) to 3).

	RV364 turning direction
more than the specified value	counter-clockwise (↺)
less than the specified value	clockwise (↻)

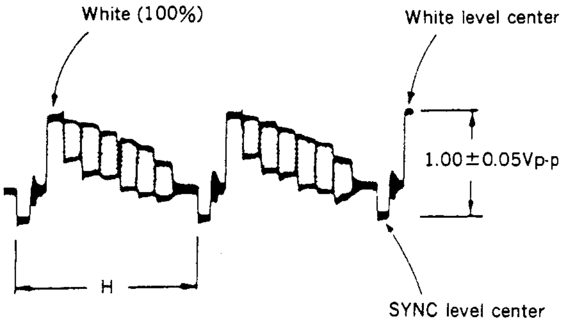


Fig. 3-15.

3-4-10. Chroma Emphasis fo Adjustment (VA-43 board)

Mode	Camera Standby (Service mode 6)
Signal	Color bar
Measurement point	IC360 Pin ⑤
Measuring instrument	Oscilloscope
Measurement element	FL362
Specified value	fo component minimum.

[Adjustment method]

1) Adjust FL362 to minimize the amplitude of flat components of chroma signal.

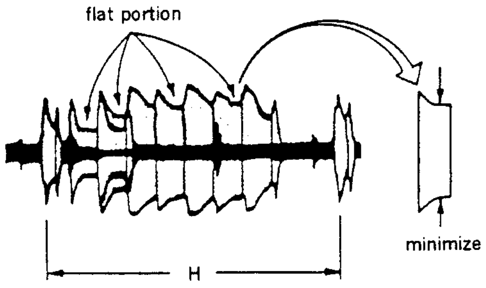

flat portion
minimize
H

Fig. 3-16.

3-4-11. AFM TRAP Adjustment (VA-43 board)

Mode	Camera Record (Service mode 6)
Signal	Color bar
Measurement point	Fig. 3-17
Measuring instrument	Oscilloscope
Adjusting element	CV361
Specified value	Minimize the amplitude

[Connection]

1) Connect 1μF capacitor and 1kΩ resistor in series between Q581 Emitter and L383, and also connect a probe to the measuring point Ⓐ.

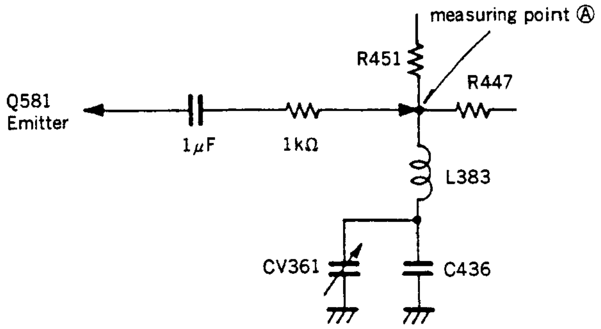

measuring point Ⓐ
R451
R447
Q581 Emitter
1μF
1kΩ
L383
CV361
C436

Fig. 3-17.

[Adjustment method]

1) Adjust with CV361 so as to minimize the amplitude.

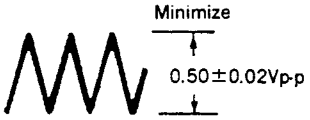

Minimize
0.50±0.02Vp-p

Fig. 3-18.

2) Remove 1μF capahitor and 1kΩ resistor.

9-4-12. PB Y De-Emphasis Level Adjustment (VA-43 board)

Mode	Playback
Signal	Alignment tape for operation check (WR5-4CSP), Color bar portion
Measurement point	IC360 Pin ㊼
Measuring instrument	Oscilloscope
Adjusting element	RV366
Specified value	0.50±0.02Vp-p

[Adjustment method]

1) Adjust RV366 for 0.50±0.02Vp-p.

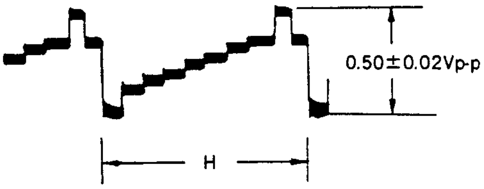

0.50±0.02Vp-p
H

Fig. 3-19.

3-4-13. Feed Back Chroma Adjustment (VA-43 board)

Mode	Camera Standby (Service mode 6)
Signal	Color bar
Measurement point	Emitter of Q374
Measuring instrument	Oscilloscope
Adjusting element	RV372
Specified value	Minimize the correlative chroma component

[Adjustment method]

1) Adjust with RV372 so as to minimize the chroma component.

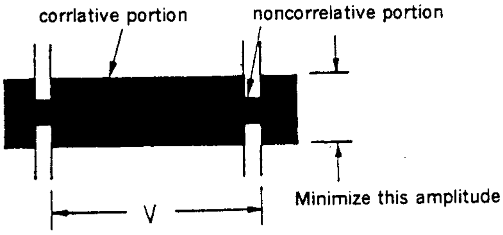
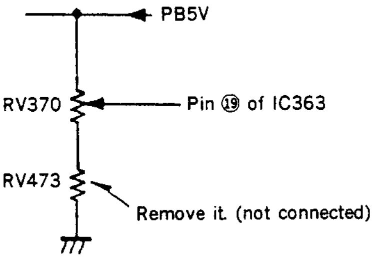

corrlative portion
noncorrelative portion
V
Minimize this amplitude

Fig. 3-20.

3-4-14. Chroma DL Gain Adjustment (VA-43 board)

There are some sets RV370 is not mounted.
In case of RV370 mounted set, remove R473 15kΩ mounted between RV370 and GND.

Note: To make pin ⑲ of IC363 to 5V adjusts to the inner setting value.


PB5V
RV370
Pin ⑲ of IC363
RV473
Remove it (not connected)

3-4-15. HUE Phase Deviation Adjustment (VA-43 board) (Use a Vectorscope)

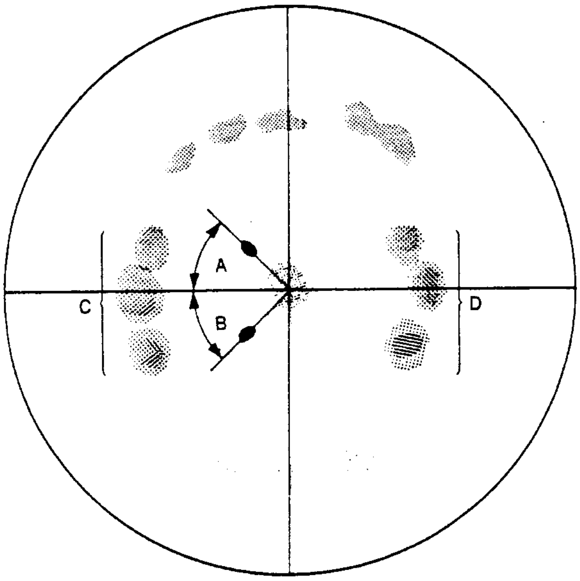
Mode	Playback+still
Signal	Alignment tape for operation check (WR5-4CL), Color bar portion
Measurement point	J361 (VIDEO OUT)
Measuring instrument	Vectorscope
Adjusting element	RV369 (FSC), RV368 (APC LPF)
Specified value	See Fig 3-22

[Connection]

1) Input 4.43MHz signal from Pin ⑯ of IC360 to 1CH of an oscilloscope.
2) Connect 1CH output of an oscilloscope to the auxiliary reference input of a vectorscope.
3) Put on the axiliary subcarrier switch of a vectorscope.

[Adjustment method]

1) Adjust with RV369 so as to equalize A and B as shown in Fig. 3-22.
2) Adjust with RV368 so as to minimize the shaking of each three brighting point of C and D.



RV369: A=B
RV368: make C and D a contrast

Fig. 3-22.

3-4-16. HUE Phase Deviation Adjustment (VA-43 board) (Use an Oscilloscope)

Mode	Playback+Still
Signal	Signal
Measurement point	Monitor TV
Measuring instrument	Monitor TV
Adjusting element	RV369 (FSC), RV368 (APC LPF)
Specified value	Minimize the HUE phase deviation on the monitor screen

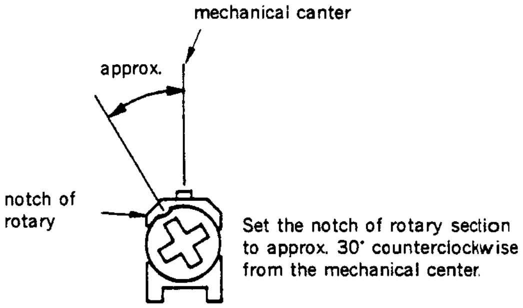

mechanical canter
approx.
notch of rotary
Set the notch of rotary section to approx. 30° counterclockwise from the mechanical center.

Fig. 3-23.

[Adjustment method]

1) Set RV369 as shown in Fig. 3-23.
2) Adjust with RV368 so as to minimize the HUE phase deviation on the monitor screen.

3-4-17. REC Y Recording Current Adjustment (VA-43 board)

Mode	Record (Service mode 6)
Signal	No signal
Measurement point	CN004 Pin ③ (REC RF) on SS-93P board
Measuring instrument	Oscilloscope
Adjusting element	RV367
Specified value	210±10mVp-p

Note : Be sure to perform Recording Current Adjustment of REC C after the REC Y Recording Current Adjustment.

[Adjustment method]

1) Adjust RV367 for 210±10mVp-p.

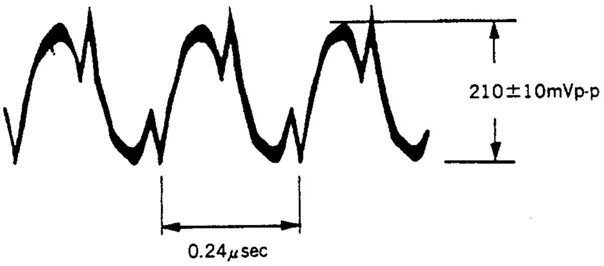


Fig. 3-24.

3-4-18. REC C Recording Current Adjustment (VA-43 board)

Mode	Record (Service mode 6)
Signal	Color bar
Measurement point	W360 Pin ④ (REC C RF)
Measuring instrument	Oscilloscope
Adjusting element	RV374
Specified value	110mVp-p

Note: Use MP type tape.

[Adjustment method]

1) Adjust RV374 for 110mVp-p.

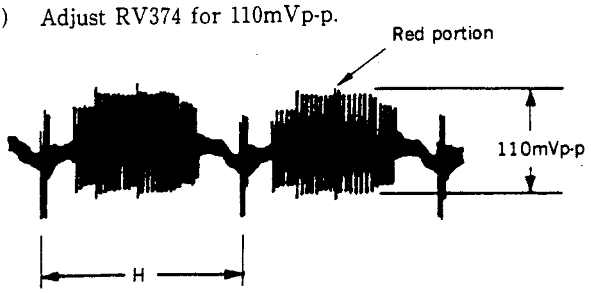


Fig. 3-25.

3-4-19. REC ATF Recording Current Check (VA-43 board)

Mode	Record (Service mode 6)
Measurement point	W360 Pin ③ (REC ATF RF)
Adjusting instrument	Oscilloscope
Specified value	approx. 370mVp-p

[Checking method]

1) Confirm that the level on W360 Pin ③ because approx. 370mVp-p.

3-4-20. REC AFM Recording Current Check (VA-43 board)

Mode	Record (Service mode 6)
Measurement point	W360 Pin ⑤ (REC AFM RF)
Measuring instrument	Oscilloscope
Specified value	150mVp-p

[Checking method]

1) Confirm the level on W360 Pin ⑤ becomes 150mVp-p.

3-4-21. EVF Display position Adjustment (VA-43 board)

Mode	Camera Standby (Service mode 6)
Object	Optional
Adjustment element	CV360
Specified value	Position the "X" mark in the center of the monitor screen

[Adjustment method]

1) Adjust CV360 to position the "X" mark at the center of the monitor sereen (a=b). (See Fig. 3-26.)

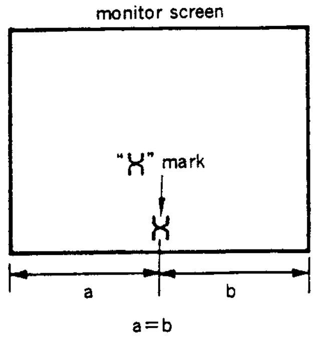


Fig. 3-26.

3-4-22. ATF Error Offset Adjustment (VA-43 board)

Mode	Camera Standby (Service mode 6)
Signal	Color bar
Measurement point	IC250 pin ⑫
Measuring instrument	Digital voltmeter
Adjusting element	RV250
Specified value	2.50±0.05Vdc

[Connection]

1) Before adjusting, connect an 220μF capacitor ot PB RF OUT as shown in Fig. 3-25.

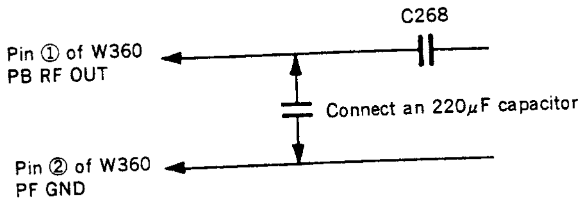

C268
Pin ① of W360
PB RF OUT
Connect an 220μF capacitor
Pin ② of W360
PF GND

Fig. 3-27.

[Adjustment method]

1) Adjust RV250 for 2.50±0.05Vdc.
2) After adjustment, remove the capacitor.

3-5. AUDIO SYSTEM ADJUSTMENT

Make adjustment by inputting the color bar signal to VIDEO IN terminal.

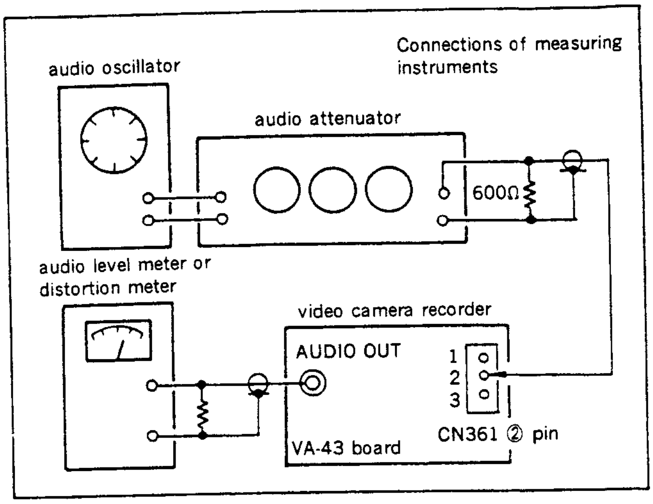

Connections of measuring instruments
audio oscillator
audio attenuator
600Ω
audio level meter or distortion meter
video camera recorder
AUDIO OUT
1
2
3
VA-43 board
CN361 ② pin

Fig. 3-28.

3-5-1. E-E Output Level Check

Mode	Record
Signal	400Hz, −32.5dBs
Measurement point	AUDIO OUT terminal
Measuring equipment	Audio level meter
Specified value	−7.5±2dBs

[Check Procedure]

1) Audio output level must be −7.5±2dBs.

3-5-2. Overall Level Characteristics Check

Mode	Self recording and playback
Signal	400Hz, −32.5dBs
Measurement point	AUDIO OUT terminal
Measuring equipment	Audio level meter
Specified value	−7.5±3dBs

[Check Procedure]

1) Record the signal.
2) Playback the recorded portion.
3) Audio output level should be −7.5±3dBs.

3-5-3. Overall Distortion Factor Check

Mode	Self recording and playback
Signal	400Hz, −32.5dBs
Measurement point	AUDIO OUT terminal
Measuring equipment	Distortion meter
Specified value	0.5% or less *1

[Check Procedure]

1) Record the signal.
2) Playback the recorded portion.
3) Distortion factor should be 0.5% or less.

*1 This is the value when the distortion factor measuring filter (Fig. 3-29) is used. It should be 1.0% or less, if the filter is not used.

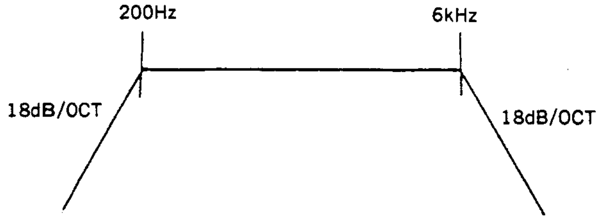


Fig. 3-29.

3-5-4. Overall Noise Level Check

Mode	Self recording and playback
Signal	No signal Connect the load resistor, 600Ω, between CN361 ② terminal and GND
Measurement point	AUDIO OUT terminal
Measuring equipment	Audio level meter
Specified value	−66dBs or less *2

[Check Procedure]

1) Recored the signal.
2) Playback the recorded portion.
3) Noise level should be −66dBs or less *2.

*2 This is the value when IHF-A auditory sense correction filter is used.

3-6. ELECTRONIC VIEWFINDER SYSTEM ADJUSTMENT

3-6-1. Horizontality/Inclination Adjustment

Mode	Playback
Signal	alignment tape for operation checking (WR5-5CSP) monoscope portion
Specified value	Refer to Fig. 3-31

[Adjustment Procedure]

1) Adjust Volume Array D (Bright) in such a way that the brightness of CRT becomes suitable to be seen (Refer to Fig. 3-32).
2) Loosen the DY (Deflection Yoke) clamping nut (Refer to Fig. 3-30).
3) Set the picture on the horizontal level by turning DY.
4) Tighten the DY clamping nut (Do not tighten excessively).

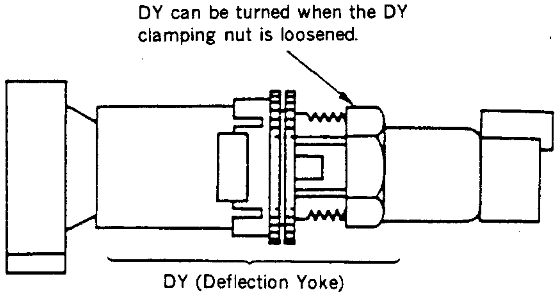
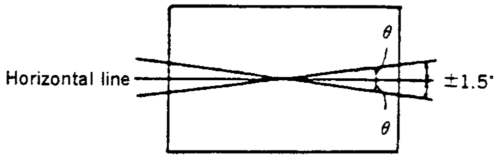
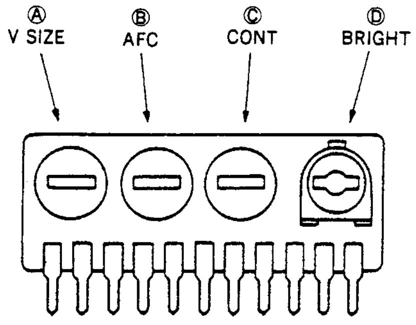


Fig. 3-30.



specified value: Make sure that the picture is kept within ±1.5° of horizontal line.

Fig. 3-31.



Volume array (CP901)

Fig. 3-32.

3-6-2. Centering Adjustment

Mode	Playback
Signal	Monoscope portion for checking the operation of alignment tape (WR5-5CSP)
Specified value	Refer to Fig. 3-34

[Adjustment Procedure]

1) By operating the centering magnet, adjust the position of picture until the upper, lower, left and right sides of picture are kept uniform.

Note : The centering position is changed by the effect of earth magnetism.
Turn the magnet 360° in horizontal direction and adjust at the center of displacement.

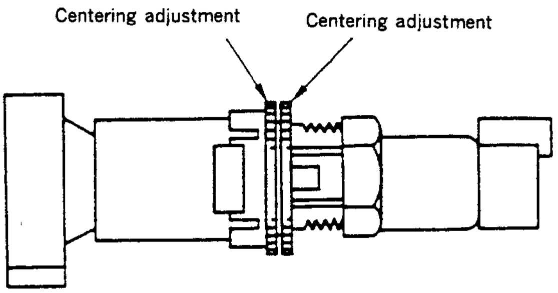


Fig. 3-33.

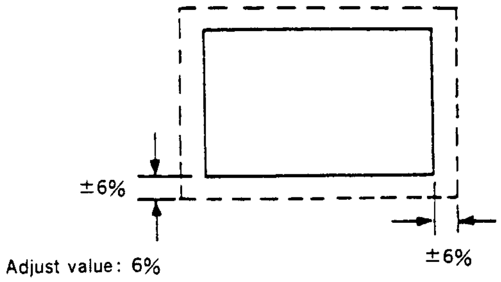


Fig. 3-34.

3-6-3. AFC Adjustment (VF-13P board)

Mode	Chart standard puiture frame camera stand-by
Signal	Color bar
Measurement point	C915 ⊕ side
Measuring equipment	Digital voltmeter or oscilloscope (DC range)
Adjustment element	Volume array Ⓑ
Specified value	2.6±0.1Vdc

[Adjustment Procedure]

1) Adjust volume array Ⓑ until 2.6±0.1Vdc is obtained (Refer to Fig. 3-32).

3-6-4. Horizontal Amplitude Adjustment (VF-13P board)

Mode	Playback
Signal	Monoscope portion for checking the operation of alignment tape (WR5-5CSP)
Adjustment element	C905
Specified value	6±3%

[Adjustment Procedure]

1) Set the focus with RV901.
2) By turning volume array Ⓐ, fit the upper part and lower part of monoscope picture to the respective upper and lower edges of screen.
(Refer to Fig. 3-35).
3) Turn the volume array until the normal level of brightness is obtained.
4) Shortcircuit or open the pattern (A) of H size adjust capacitor (C905) so that the overscan in horizontal direction becomes 6±3% (Left−right total). (Refer to Fig. 3-36).

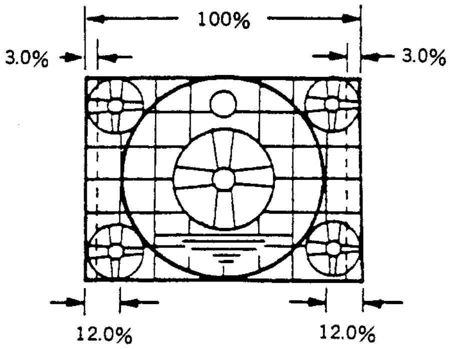
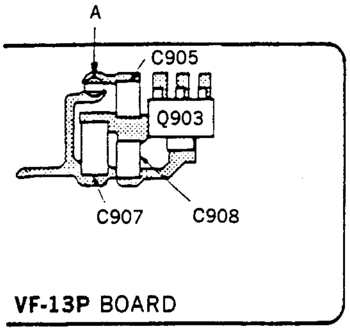


Fig. 3-35.



A	H size
Open	small ↕
Short	Large

Fig. 3-36.

3-6-5. Vertical Amplitude Adjustment (VF-13P board)

Mode	Playback
Signal	Monoscope portion for checking the operation (WR5-5CSP)
Adjustment element	Volume array Ⓐ
Specified value	6±3%

[Adjustment Procedure]

1) With volume array Ⓐ, set the vertical overscan to 6± 3% (upper/lower total).

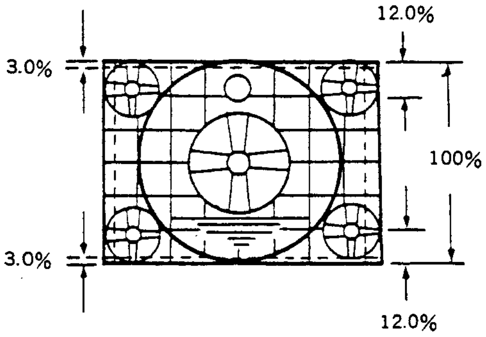


Fig. 3-38.

3-6-6. Brightness/Contrast Adjustment (VF-13P board)

Mode	Playback
Signal	Monoscope portion for checking the operation (WR5-5CSP)
Adjustment element	Brightness : Volume array Ⓓ Contrast : Volume array Ⓒ

[Adjustment Procedure]

1) Alternately adjust volume arrays, Ⓓ and Ⓒ until the contrast of gray scale is properly displayed.
(The bright portion should not be so bright as the contrast of gray scale is clearly shown. The dark portion should not be so dark as the difference between the first section (darkest place) and the 3rd section of gray scale is not clearly identified).

3-6-7. Focus Adjustment (VF-13P board)

Mode	Playback
Signal	Monoscope portion for checking the operation (WR5-5CSP)
Adjustment element	RV901

[Adjustment Procedure]

1) Adjust to the best focus point with RV901.

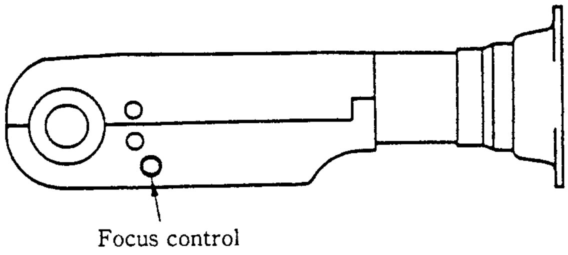


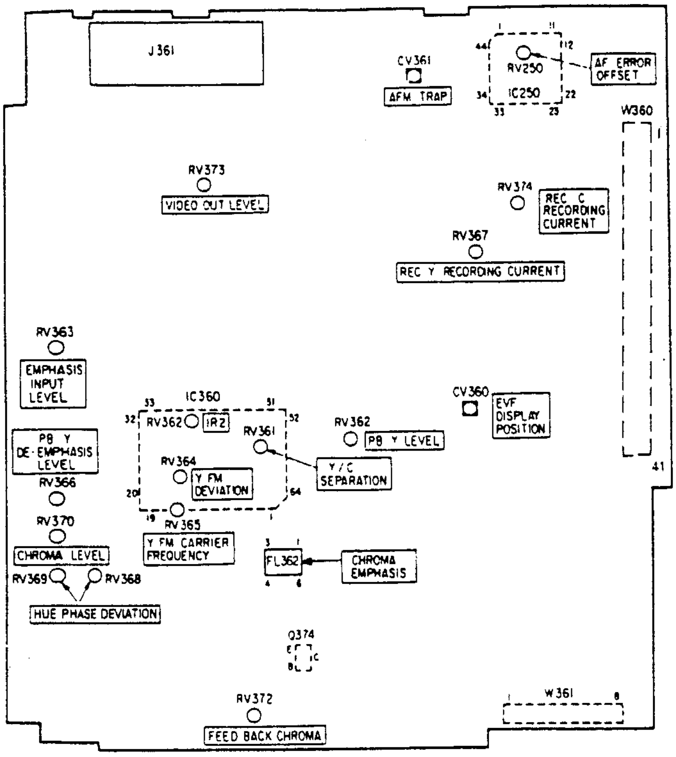
Fig. 3-39.

3-6-8. Horizontal Amplitude and Vertical Amplitude check

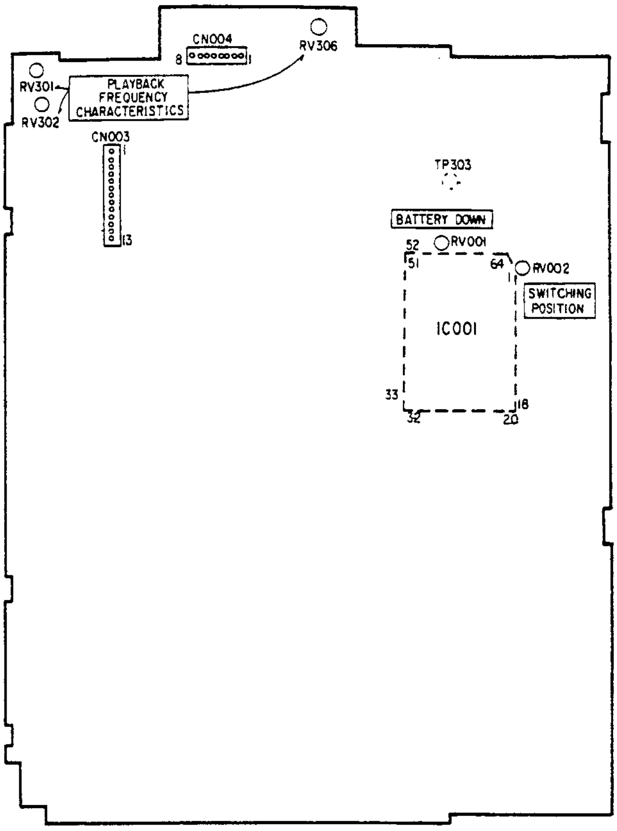
Make sure that 3-6-4. Horizontal Amplitude Adjustment and 3-6-5. Vertical Amplitude Adjustment are within the specified range. When the specified value is not met, make readjustments. In such a case, 3-6-6. Brightness/Contrast Adjustment and 3-6-7. Focus Adjustment should also be made at the same time.

3-7. ADJUSTING PARTS LOCATION DIAGRAM

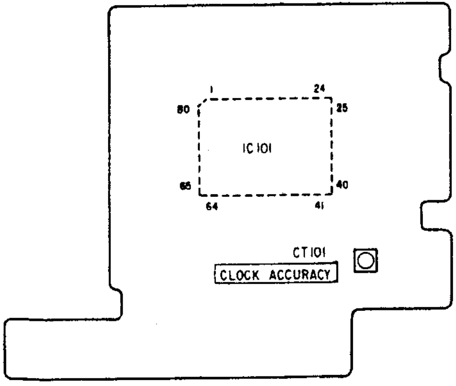
VA-43 BOARD (COMPONENT SIDE)


J361
CV361
AFM TRAP
RV250
IC250
AF ERROR OFFSET
W360
RV373
VIDEO OUT LEVEL
RV374
REC C RECORDING CURRENT
RV367
REC Y RECORDING CURRENT
RV363
EMPHASIS INPUT LEVEL
IC360
RV362
IR2
RV361
RV364
Y FM DEVIATION
RV365
Y FM CARRIER FREQUENCY
Y/C SEPARATION
RV362
PB Y LEVEL
CV360
EVF DISPLAY POSITION
PB Y DE-EMPHASIS LEVEL
RV366
RV370
CHROMA LEVEL
RV369
RV368
HUE PHASE DEVIATION
FL362
CHROMA EMPHASIS
Q374
RV372
FEED BACK CHROMA
W361

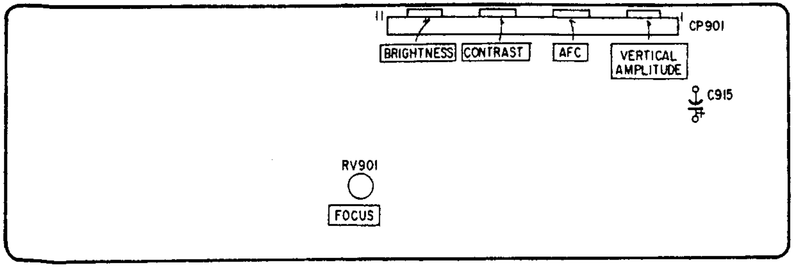
SS-93P BOARD (CONDUCTOR SIDE)


CN004
RV306
RV301
RV302
PLAYBACK FREQUENCY CHARACTERISTICS
CN003
TP303
BATTERY DOWN
RV001
RV002
SWITCHING POSITION
IC001

FC-25P BOARD (COMPONENT SIDE)


IC101
CT101
CLOCK ACCURACY

VF-13P BOARD (COMPONENT SIDE)

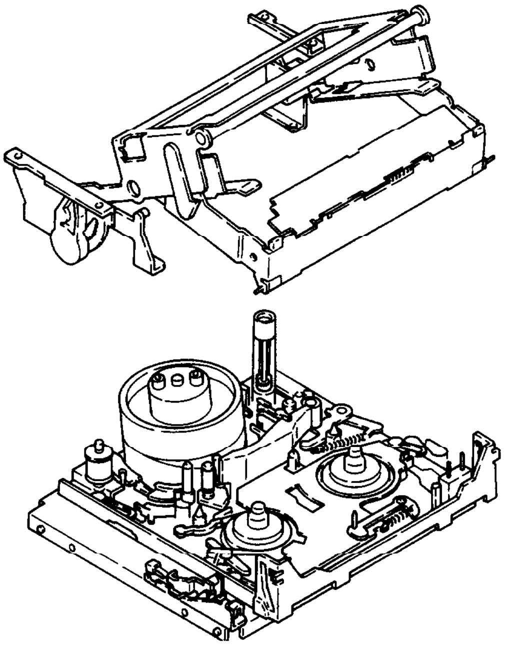

CP901
BRIGHTNESS
CONTRAST
AFC
VERTICAL AMPLITUDE
C915
RV901
FOCUS

8mm Video MECHANICAL ADJUSTMENT MANUAL

TYPE 3(O'MECHANISM)

Video8

File with the SERVICE MANUAL.
This manual contains the SUPPLEMENT-1.



(Reference)

	Total arc of contact of tape to Drum	REC/PB function	Tape loading system (Cassette loading)	Main models
TYPE 1 (K MECHANISM)	220°	REC/PB	Threading ring	CCD-V8, V8AF, V100 V7, V110
TYPE 2 (O MECHANISM)	180°	REC only	Loading slider S.T (Liner skating)	CCD-M8, M10
TYPE 3 (O'MECHANISM)	180°	REC/PB	Loading slider S.T (Liner skating)	CCD-V30, V50, V90 V3, V4, V5, V9

8 VIDEO CAMERA RECORDER

SONY®

MICROFILM

TABLE OF CONTENTS

Section *Title* *Page*

1. Preparation for Mechanism Check,Adjustment and Replacement

1-1. Cassette Arm Assembly 3
1-2. LS Cassette Compartment Assembly 4
1-3. Removing Cassette Tape when in Loading State 5
1-4. Operation with Cassette and Cassette Arm Assembly and LS Cassette Compartment Removed.. 6
1-5. Handling of Mode Selector 7

2. Periodic Check and Maintenance

2-1. Cleaning of Rotary Drum Assembly 9
2-2. Cleaning of Tape Path 9
2-3. Cleaning of Drive System.......................... 9
2-4. Periodic Check 10
2-5. Service Jigs 11

3. Mechanical Check,Adjustment and Replacement

3-1. Reel Lock Lever Assembly 13
3-2. Pendulume Stopper Plate 14
3-3. S Reel Table Assembly 15
3-4. T Reel Table Assembly 16
3-5. Pinch Arm B Assembly 17
3-6. Pinch Arm C Assembly 18
3-7. TG-1 Arm Assembly 19
3-8. TG-1 Band Assembly 20
3-9. Soft Brake Assembly 20
3-10. LS Chassis Assembly 21
3-11. TG-7 Arm Assembly 22
3-12. Pinch Arm A Assembly 23
3-13. M Slider Assembly 24
3-14. TG-4 Base Assembly,TG-5 Base Assembly 25
3-15. Loading Slider T Assembly 26
3-16. Loading Slider S Assembly 27
3-17. Phase Adjustment 28
3-18. Gear Tray in Operation Check...................... 29
3-19. Flexible Board 30
3-20. Cassette Compartment Lock Assembly 31
3-21. LM Motor Assembly 32
3-22. Capstan Motor Assembly 33
3-23. TG-2 34
3-24. Drum Unit.. 35
3-25. Rotary Upper Drum Replacement 36
3-26. Reel Table Height Check 38
3-27. FWD/RVS Torque Check 38
3-28. Tension Regulator Position Adjustment 39
3-29. FWD Back Tension Adjustment 40
3-30. TS Gear Assembly 41

4. Tape Path Adjustment

4-1. Track Shift Jig Connection 42
4-2. Preparation for Adjustment 43
4-3. Tracking Coarse Adjustment 44
4-4. Tracking Fine Adjustment.......................... 44
4-5. No.2 Guide (TG-2) Adjustment 45
4-6. No.7 Guide (TG-7) Adjustment 45
4-7. CUE,REV Waveform Check 46
4-8. Check after Adjustment 46

SUPPLEMENT-1

1. PREPARATION FOR MECHANISM CHECK, ADJUSTMENT AND REPLACEMENT

Refer to Service Manual, "Disassembly" for removal of the cabinet and boards.
Adjustment is done with the mechanism in EJECT state. (Refer to "1-5. Handling of Mode Selector" for information on putting the mechanism into EJECT state.)

1-1. Cassette Arm Assembly (Fig. 1.)

1. Removal

1) Remove screws ❶, ❷, ❸ and ❹ .
2) Remove cassette arm assembly ❺.

2. Mounting

1) Mount cassette arm assembly ❺ on the set so that the two pins ❻ go into the specified locations.
2) Loosely tighten screws ❶ and ❷ and tigten screws ❸ and ❹.
3) Tighten screws ❶ and ❷.

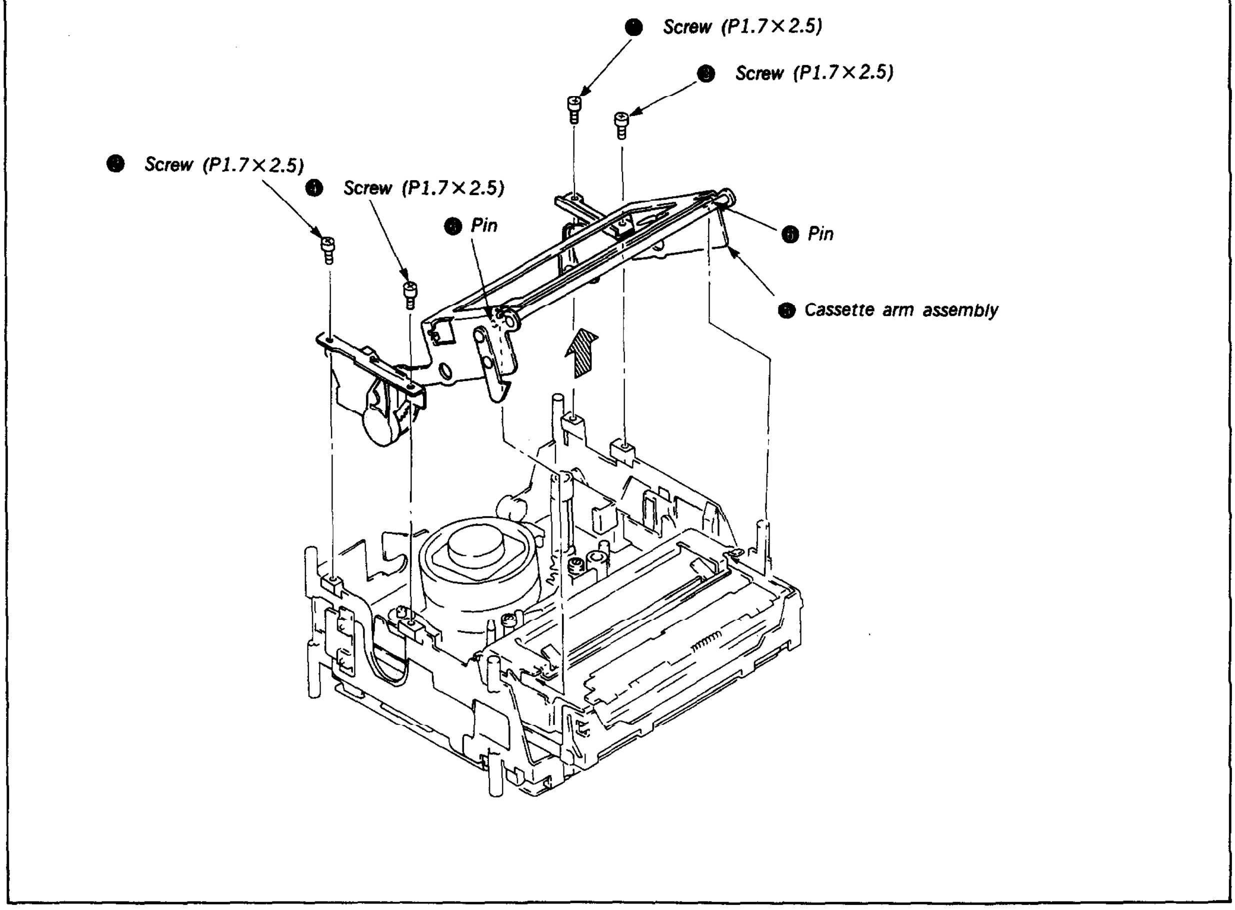

❶ Screw (P1.7×2.5)
❷ Screw (P1.7×2.5)
❸ Screw (P1.7×2.5)
❹ Screw (P1.7×2.5)
❻ Pin
❻ Pin
❺ Cassette arm assembly

Fig. 1.

1-2. LS Cassette Compartment Assembly (Fig. 2.)

1. Removal

1) Remove screws ❶, ❷, ❸ and ❹.
2) Press LS frame ❻ hole ❽ in the direction of arrow Ⓐ and release pins ❺ and ❾. (Pin (C) ❺ is longer, so release pin (B) ❾ first.)
3) Remove LS cassette compartment assembly ❼.

2. Mounting

1) Mount LS cassette compartment assembly ❼ on the set.
2) Press LS frame ❻ hole ❽ in the direction of arrow Ⓐ and insert the two pins ❺ and ❾. (Insert the longer pin (C) ❺ first.)
3) Loosely tighten screws ❸ and ❹ and then tighten the screws in the order ❶, ❷, ❸ and ❹.

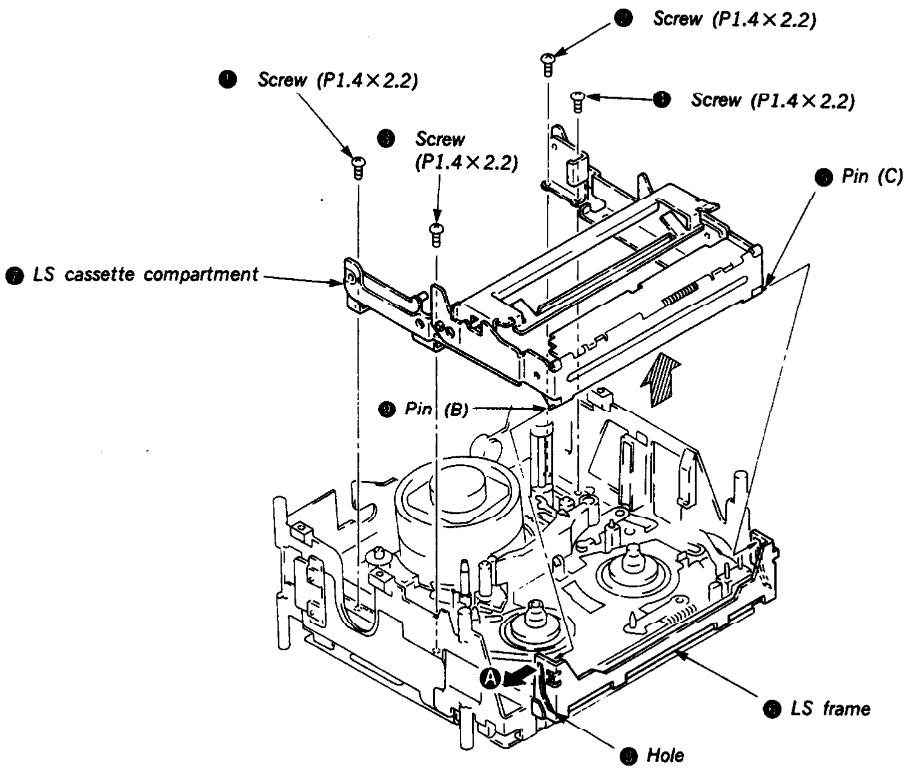

❷ Screw (P1.4×2.2)
❶ Screw (P1.4×2.2)
❹ Screw (P1.4×2.2)
❸ Screw (P1.4×2.2)
❺ Pin (C)
❼ LS cassette compartment
❾ Pin (B)
Ⓐ
❻ LS frame
❽ Hole

Fig. 2.

1-3. Removing Cassette Tape when in Loading State

1) Open the PC board back of mechanism chassis with reference to the Service Manual.
2) Connect the mode selector, referring to 1-5.

   Note:

   The modes indicated by ☐ are the modes set by pressing the mode selector button.
3) Set for GUIDE LOAD mode and move the tape guides from the positions shown in Fig. 4 to those shown in Fig. 5.
4) Rotate the capstan motor rotor ● in the direction of the arrow and take the tape up inside the cassette. (Fig. 3.)

   Note:

   Even in GUIDE LOAD mode, if the tape guides are closer to the cassette than the positions showin in Fig. 5, the tape can not be taken up.
5) Check that the tape has been taken up completely, set for EJECT mode and remove the cassette.

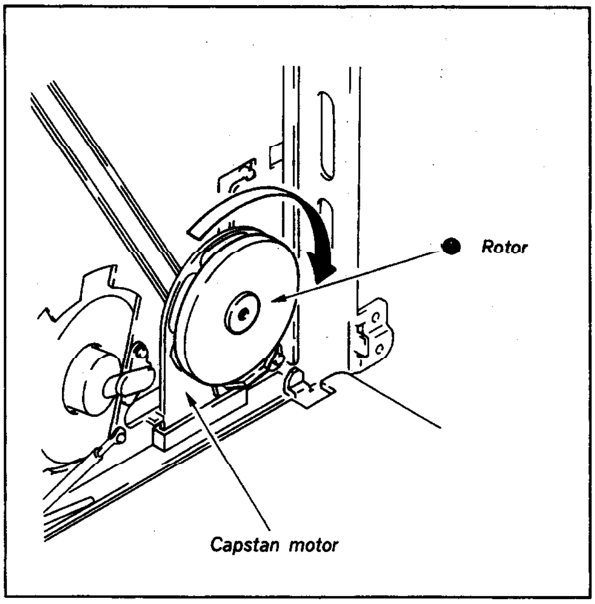

● Rotor
Capstan motor

Fig. 3.

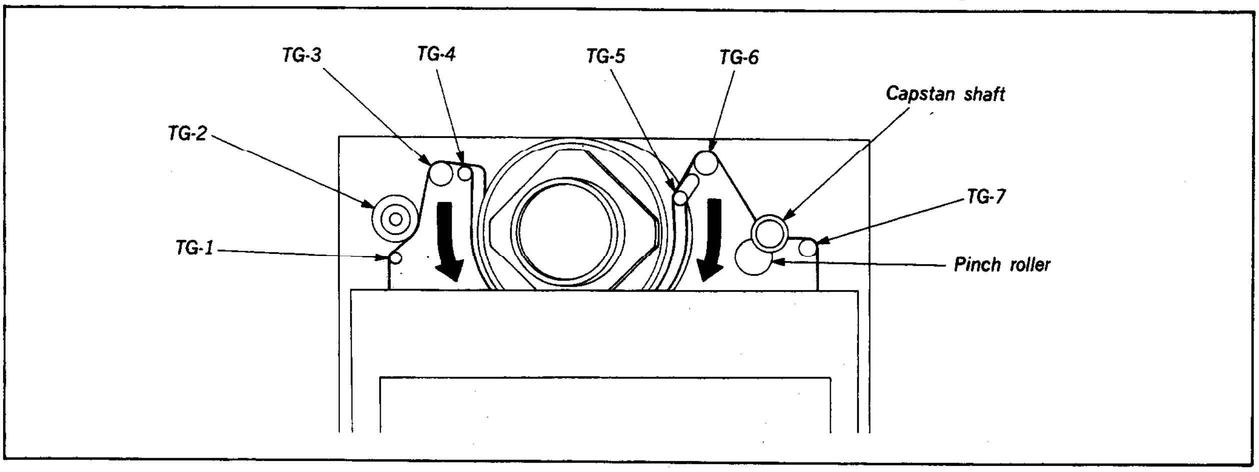

TG-3
TG-4
TG-5
TG-6
Capstan shaft
TG-2
TG-7
TG-1
Pinch roller

Fig. 4.

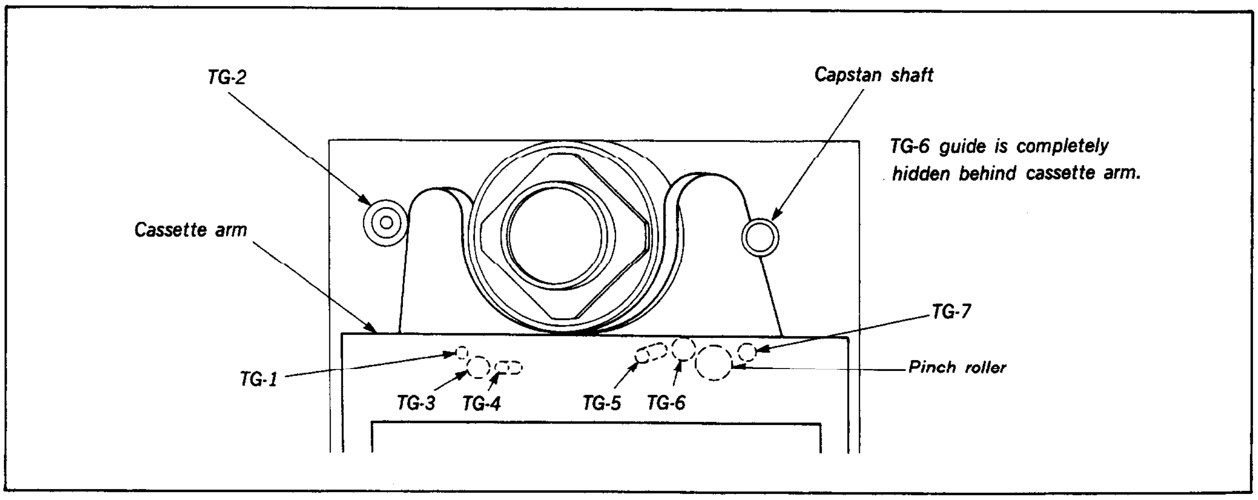

TG-2
Capstan shaft
TG-6 guide is completely hidden behind cassette arm.
Cassette arm
TG-7
Pinch roller
TG-1
TG-3
TG-4
TG-5
TG-6

Fig. 5.

1-4. Operation with Cassette and Cassette Arm Assembly and LS Cassette Compartment Removed

1. Putting into Loading State (Fig. 6.)

1) Power should be supplied without cabinet and Camera sections by refering to service manual. (Make mechanism deck operate.)
2) Place cap ● on LED assembly ●.
3) Press push SW ● pin (ON state) and secure with adhesive tape ●.
4) The set will go into loading state when the return prevention arm ● is pressed in the direction of arrow Ⓐ.

2. Putting into REC State

1) After completing 1. above, set power switch to VTR. (or CAMERA)
2) Turn REC SW ON.

3. Putting into EJECT

1) Turn EJECT SW ON.

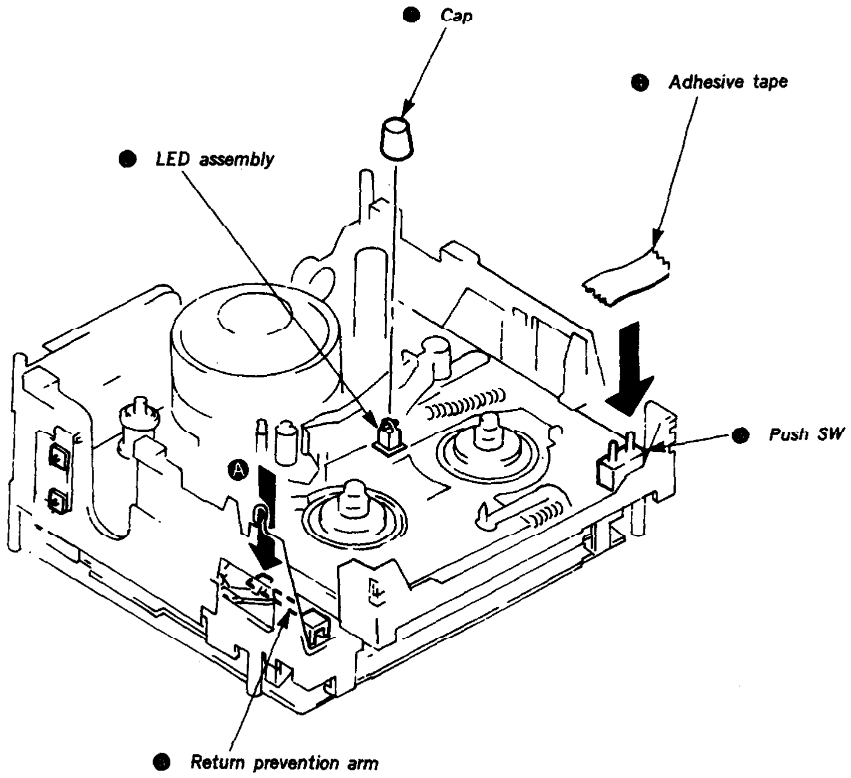


Fig. 6.

1-5. Handling of Mode Selector

- Mount MODE SELECTOR II panel. (Fig. 7)

1. Names of Parts (Fig. 8.)

2. Connection (Fig. 9)

1) Remove flexible board connector with a blade screw-driver or the like.

   Note:

   Be careful not to pull the flexible board when removing. If it is pulled too hard, the pattern may be cut.

2) Plug in MODE SELECTOR II conversion connector.
3) Plug M-SW connector into MODE SELECTOR II conversion connector.

3. Handling

1) Use M mode switching button only.
2) During selection, "BLANK" with light up when no mode is selected.
3) When the right side M mode switching button is pressed continuously, EJECT → USE → GUIDE LOAD → REC → READY will light up in that order.
4) For READY ⇢ EJECT, press the left side switching button for the target mode.

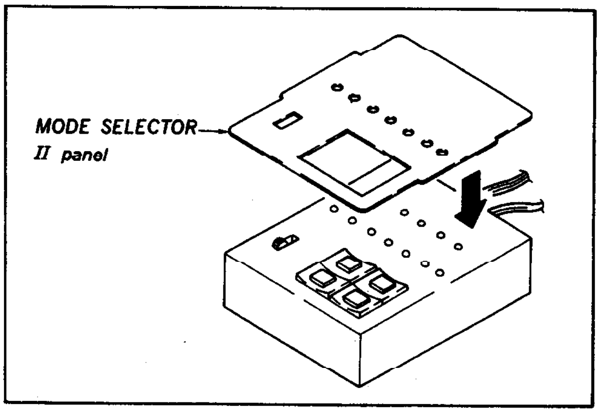

MODE SELECTOR
II panel

Fig. 7.

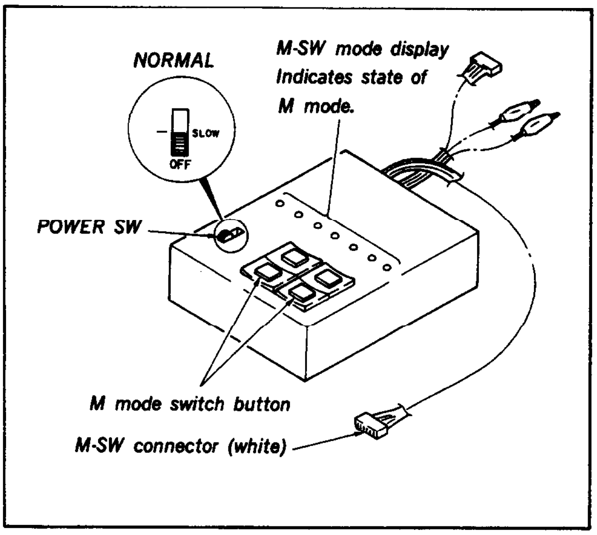

NORMAL
SLOW
OFF
M-SW mode display
Indicates state of
M mode.
POWER SW
M mode switch button
M-SW connector (white)

Fig. 8.

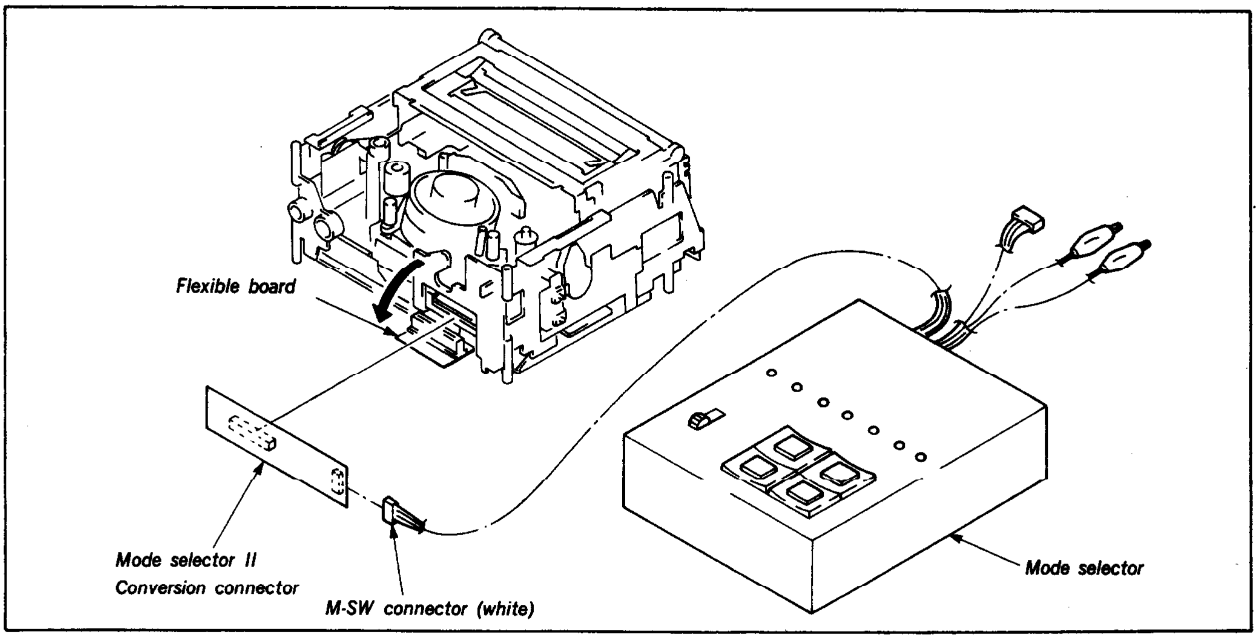
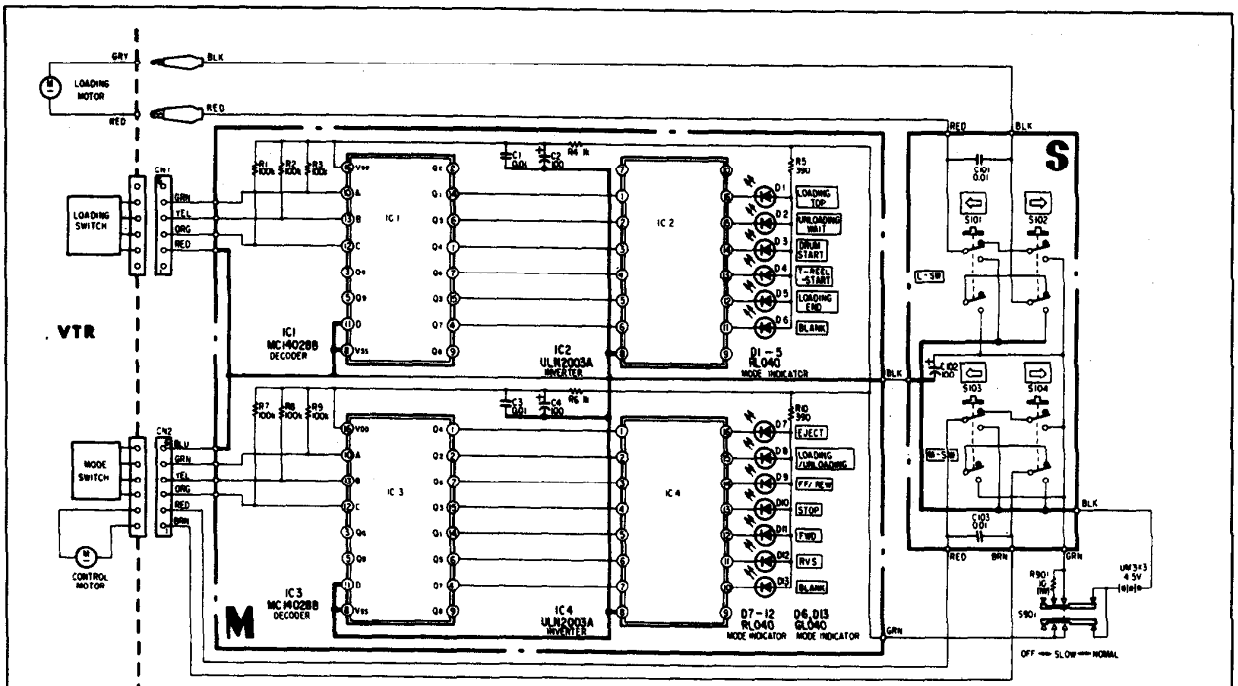

Flexible board
Mode selector II
Conversion connector
M-SW connector (white)
Mode selector

Fig. 9.

4. Mode Selector Schematic Diagram


GRY
BLK
RED
LOADING MOTOR
LOADING SWITCH
CN1
GRN
YEL
ORG
RED
VTR
MODE SWITCH
CN2
BLU
CONTROL MOTOR
IC1
MC14028B
DECODER
IC2
ULN2003A
INVERTER
IC3
MC14028B
DECODER
IC4
ULN2003A
INVERTER
D1–5
RL040
MODE INDICATOR
D7–12
RL040
MODE INDICATOR
D6, D13
GL040
MODE INDICATOR
LOADING TOP
UNLOADING WAIT
DRUM START
T-REEL-START
LOADING END
BLANK
EJECT
LOADING/UNLOADING
FF/REW
STOP
FWD
RVS
BLANK
M
S
S101
S102
S103
S104
L-SW
M-SW
C101 0.01
C102 100
C103 0.01
R901
S901
OFF ← SLOW ← NOMAL

M-SW (IC 3)

DECODER INPUT			MODE	LED NO
C	B	A		
0	0	0		
0	0	1	FWD	D11
0	1	0	LOADING/UNLOADING	D8
0	1	1	STOP	D10
1	0	0	EJECT	D7
1	0	1	RVS	D12
1	1	0	FF/REW	D9
1	1	1	BLANK	D13

0: INPUT LEVEL L
1: INPUT LEVEL H

L-SW (IC 1)

DECODER INPUT			MODE	LED NO
C	B	A		
0	0	0		
0	0	1	LOADING TOP	D1
0	1	0		
0	1	1	LOADING END	D5
1	0	0	DRUM START	D3
1	0	1	UNLOADING WAIT	D2
1	1	0	T-REEL-START	D4
1	1	1	BLANK	D6

SWITCH		DIRECTION OF MOTOR REVOLUTION
⇦	⇨	
OFF	OFF	STOP
ON	OFF	⇦
OFF	ON	⇨

⇦ L-SW LOADING END → LOADING TOP
M-SW RVS → EJECT

⇨ L-SW LOADING TOP → LOADING END
M-SW EJECT → RVS

5. Mode Selector Parts List

Ref. No.	Part No.	Description		
	CAPACITORS			
C1	1-108-579-00	MYLAR	0.01μF	50V
C2	1-123-333-00	ELECT	100μF	24V
C3	1-108-579-00	MYLAR	0.01μF	50V
C4	1-123-333-00	ELECT	100μF	24V
C101	1-108-579-00	MYLAR	0.01μF	50V
C102	1-123-333-00	ELECT	100μF	24V
C103	1-108-579-00	MYLAR	0.01μF	50V
	DIODE			
D1	8-719-812-31	DIODE TLR123		
D2	8-719-812-31	DIODE TLR123		
D3	8-719-812-31	DIODE TLR123		
D4	8-719-812-31	DIODE TLR123		
D5	8-719-812-31	DIODE TLR123		
D6	8-719-812-33	DIODE TLG123A		
D7	8-719-812-31	DIODE TLR123		
D8	8-719-812-31	DIODE TLR123		
D9	8-719-812-31	DIODE TLR123		
D10	8-719-812-31	DIODE TLR123		
D11	8-719-812-31	DIODE TLR123		
D12	8-719-812-31	DIODE TLR123		
D13	8-719-812-33	DIODE TLG123A		

Ref. No.	Part No.	Description		
	IC			
IC1	8-759-240-28	IC TC4028BP		
IC2	8-759-120-03	IC μPA2003C		
IC3	8-759-240-28	IC TC4028BP		
IC4	8-759-120-03	IC μPA2003C		
	RESISTORS			
R1	1-247-179-00	CARBON	100K	1/4W
R2	1-247-179-00	CARBON	100K	1/4W
R3	1-247-179-00	CARBON	100K	1/4W
R4	1-247-131-00	CARBON	1K	1/4W
R5	1-247-121-00	CARBON	390	1/4W
R6	1-247-131-00	CARBON	1K	1/4W
R7	1-247-179-00	CARBON	100K	1/4W
R8	1-247-179-00	CARBON	100K	1/4W
R9	1-247-179-00	CARBON	100K	1/4W
R10	1-247-121-00	CARBON	390	1/4W
R901	1-214-594-00	METAL	10	1W

2. PERIODIC CHECK AND MAINTENANCE

In order to give full play to set performance and function, perform the following maintenance and period checks of the equipment and tape. In addition, regardless of the length of use, service the set as follows after repairing.

2-1. Cleaning of Rotary Drum Assembly

1) Lightly press a chamois cloth (Ref. No. J-2) soaked in cleaning fluid (Ref. No. J-1) against the rotary drum assembly and clean by slowing turning the rotary upper drum assembly counterclockwise by hand.
   Note:
   Do not turn the motor by turning the power on or rotate clockwise. Also, the head tip will be damaged if the chamois cloth is moved vertically against it, so make sure to follow the instructions given above for cleaning the drum.

2-2. Cleaning of Tape Path (Fig. 10)

1) In EJECT state, clean the tape transport system (TG-1, 2, 3, 4, 5, 6, 7, pinch roller, capstan shaft) with a chamois cloth soaked in cleaning fluid.
   Note:
   Be careful that grease and oil from the linking mechanism do not get on the cloth.

2-3. Cleaning of Drive System

1) Clean the drive system (relay belt, reel table surfaces) with a cloth soaked in cleaning fluid.

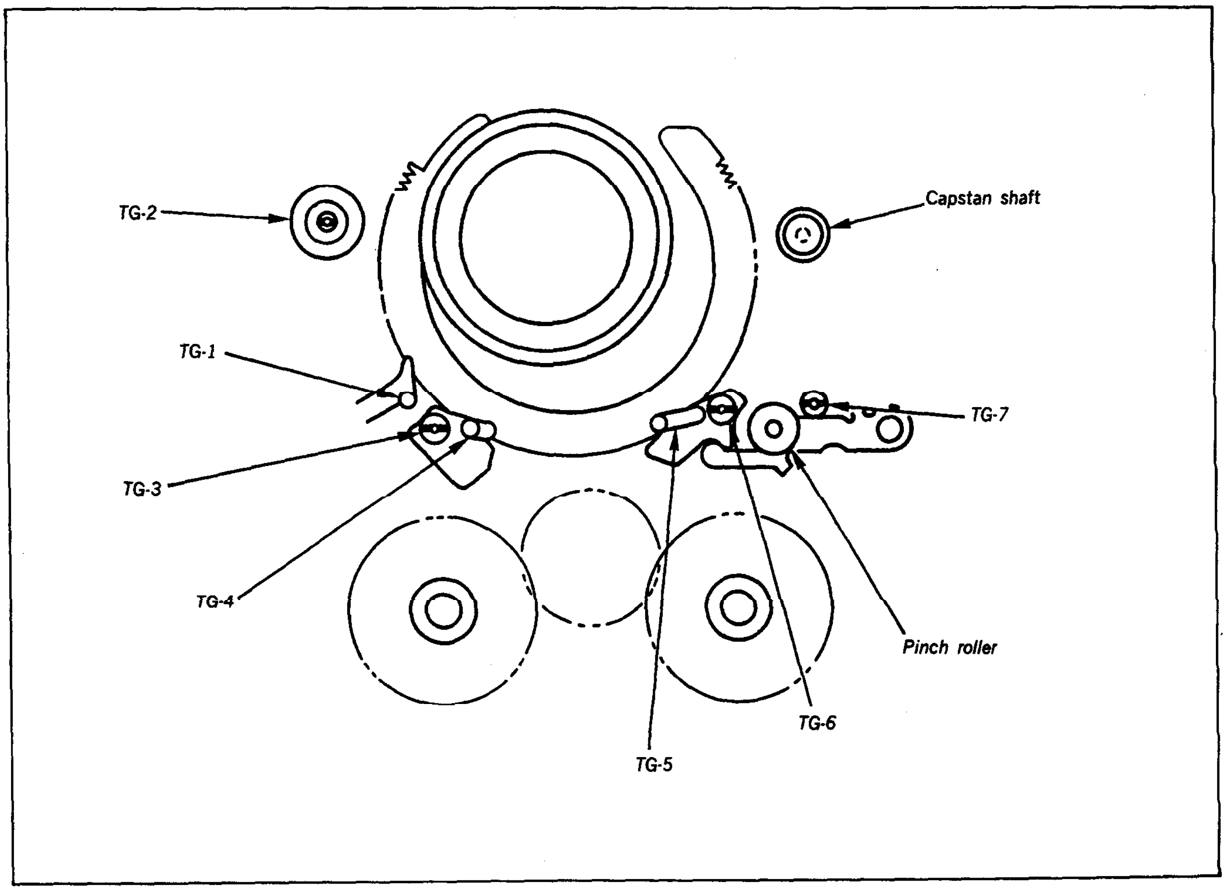


Fig. 10.

2-4. Periodic Check

Location of maintenance & check		Hours of use (H)										Remarks
		500	1000	1500	200	2500	3000	3500	4000	4500	5000	
	Cleaning of tape path surfaces	○	○	○	○	○	○	○	○	○	○	Be careful of oil
	Cleaning and degausing of rotary drum assembly	○	○	○	○	○	○	○	○	○	○	Be careful of oil
Drive system	Relay belt	—	☆	—	☆	—	☆	—	☆	—	☆	3-695-637-01
	Capstan shaft	—	◎	—	◎	—	◎	—	◎	—	◎	Be careful not to get oil on the tape path surfaces.
	Relay pulley shaft	—	◎	—	◎	—	◎	—	◎	—	◎	
	Loading motor	—	☆	—	☆	—	☆	—	☆	—	☆	8-835-222-01
Performance check	Abnormal noise	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	
	Back tension measurement	—	☆	—	☆	—	☆	—	☆	—	☆	
	Brake system	—	☆	—	☆	—	☆	—	☆	—	☆	
	FWD } torque measurement RVS }	—	☆	—	☆	—	☆	—	☆	—	☆	

○ Cleaning ◎ Oil ☆ Check

Note:

When performing an overhaul, refer to the above items when replacing parts.

Note: Oil

Be sure to use the specified oil. (The wrong viscosity may cause problems)

Oil: Part No. 7-661-088-61

(Mitsubishi Diamond Oil Hydrofluid NT-68)

Make sure that there are no impurities in the oil which is used for lubrication of bearings. (Friction or burning of the bearings may be caused if dirty oil is used.)

One drop of oil is the amount which sticks to the tip of a rod which is 2mm in diameter, as shown in Fig. 11.

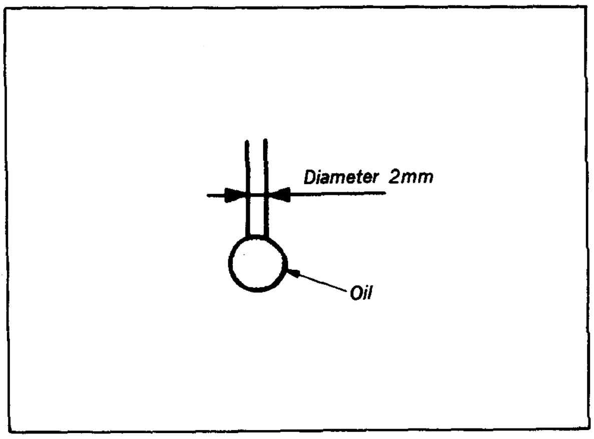


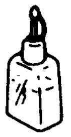
Fig. 11.

2-5. Service Jigs

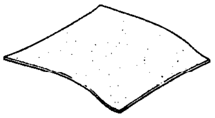
Ref. No.	Name	Part No.	Fixture No.	Use
J-1	Cleaning fluid	Y-2031-001-0	———	
J-2	Chamois cloth	2-034-697-00	———	
J-3	Head degausser	Commercially available	———	
J-4	Small adjustment mirror Spare mirror	J-6080-029-A J-6080-030-1	SL-5052	Tape path
J-5	Alignment tape NTSC (WR5-1N) PAL (WR5-1C)	8-967-995-01 8-967-995-06		Tape path
J-6	Dial tension gauge	J-6080-827-A		Torque measurements
J-7	Tension measurement reel	J-6080-831-A		with ϕ30 tape
J-8	Tension measurement reel	J-6080-832-A		with ϕ16 string
J-9	FWD, RVS winding torque cassette	J-6080-824-A	GD-2086	
J-10	Rotary drum jig	(packed with repair rotary upper drum)		
J-11	Tape path screwdriver	J-6080-811-A		Tape guide adjustment
J-12	Mode selector II panel	J-6080-844-A		
J-13	Mode selector	J-6080-825-A		For all models
J-14	Mode selector II conversion connector	J-6080-845-A		
J-15	Tape end detection filter	J-6080-848-A		Tape end detection adjustment

Other equipment used: Oscilloscope
Analog tester (20kΩ)

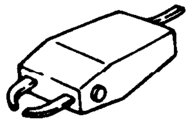
J-1



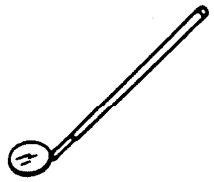
J-2



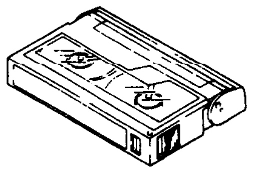
J-3



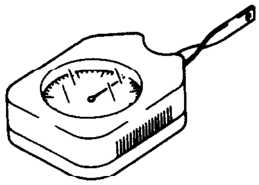
J-4



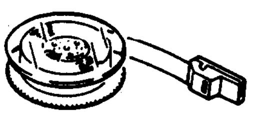
J-5



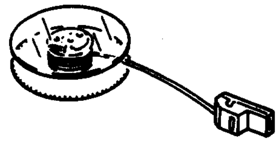
J-6



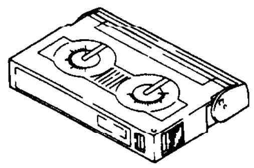
J-7



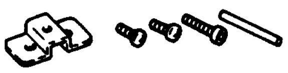
J-8



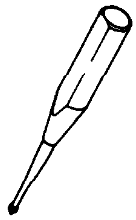
J-9



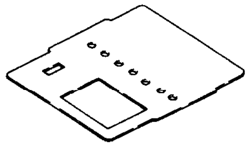
J-10 (Packed with the rotary upper drum for repairs and replacement)



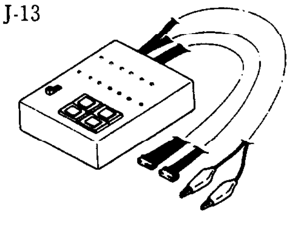
J-11



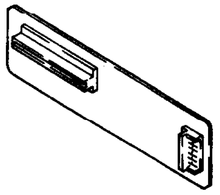
J-12



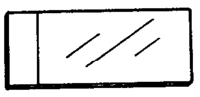
J-13



J-14



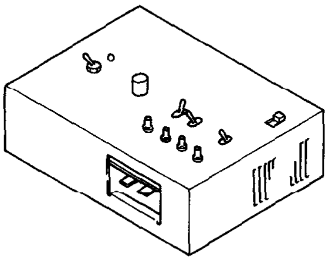
J-15



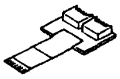
Ref. No.	Name	Part No.	Fixture	Use
J-16*	Track shift jig	J-6080-891-A	———	Tape path
J-17	Extension cable U	J-6080-901-A	———	Connection cable for track shift and monitor jig
J-18	CTL connection cord	J-6080-891-1	———	
J-19	RF/SWP connection cord	J-6080-891-2	———	

* The track shift & monitor Jig (NTSC J-6080-843-A PAL J-6080-851-A) can be used instead of the track shift jig (J-6080-891-A).

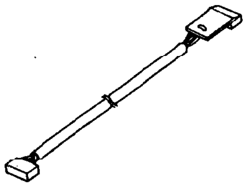
J-16



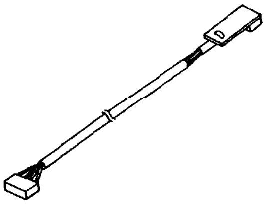
J-17



J-18



J-19



3. MECHANICAL CHECK, ADJUSTMENT AND REPLACEMENT

Note 1:

Use mode selector (Ref. No. J-13) when performing these mechanical checks, adjustments and replacements.

Note 2:

The modes indicated by ☐ are those set by pressing the mode selector buttons.

3-1. Reel Lock Lever Assembly (Fig. 12)

1. Removal

1) Refer to 1-1. and 1-2. and remove the cassette arm assembly and LS cassette compartment assembly.
2) Remove tension coil spring ❶ from notch ❷.
3) Remove stopper washer ❸ and remove reel lock lever assembly ❹ from the shaft ❺.

2. Mounting

1) Mount reel lock lever assembly ❹ on shaft ❺ and secure with stopper washer ❸.
2) Hook tension coil spring ❶ into notch ❷.
3) Refer to 1-1. and 1-2. and mount the cassette arm assembly and LS cassette compartment assembly.

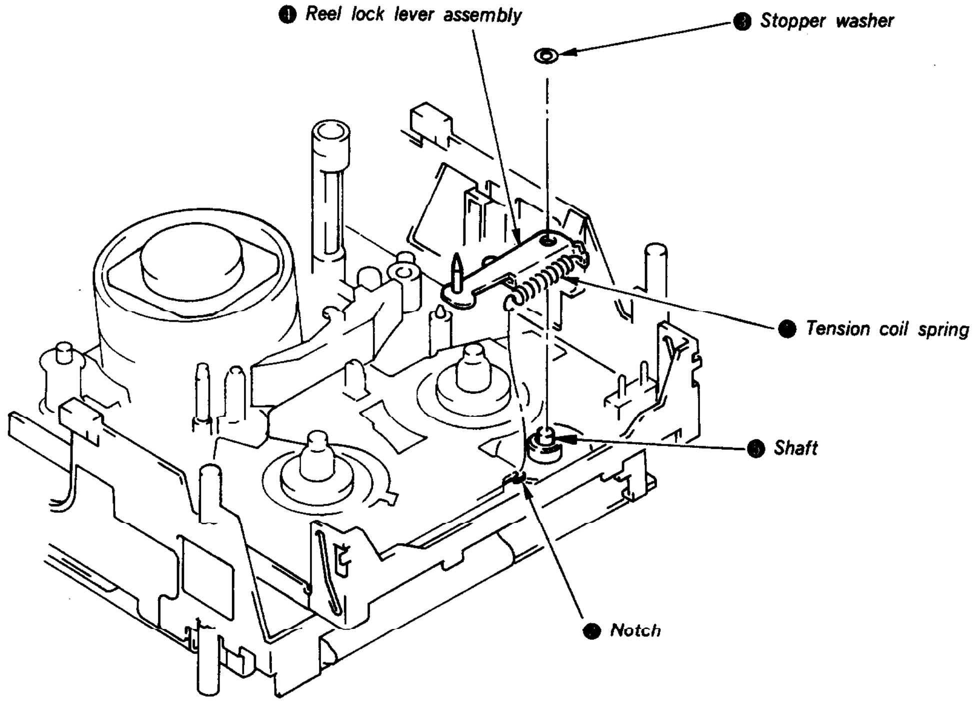


Fig. 12.

3-2. Pendulume Stopper Plate (Fig. 13)

1. Removal

1) Refer to 1-1. and 1-2. and remove the cassette arm assembly and LS cassette compartment assembly.
2) Refer to 3-1. and remove the reel lock lever assembly.
3) Press LED assembly ❶ claw ❼ in the direction of arrow Ⓐ and lift LED assembly ❶ up to remove. Remove claw ❷.
4) Remove screws ❸ and ❹.
5) Remove pendulum stopper plate ❻ from the two claws ❺.

Note:

When removing and mounting, be careful not to press claw ❼ too hard, or it may break or bend.

2. Mounting

1) Set to READY mode.
2) Place LED assembly ❶ so that it is on top of pendulum stopper plate ❻ and insert into the two claws ❺ and dowels ❾.
3) Tighten screws ❸ and ❹ in that order.
4) Hook LED assembly ❶ claw ❷ and press in the direction of arrow Ⓑ.
5) Set to EJECT mode.
6) Refer to 3-1. and mount the reel lock lever assembly.
7) Refer to 1-1. and 1-2. and mount the cassette arm assembly and LS cassette compartment assembly.

Note 1:

When mounting pendulum stopper plate ❻, be careful that the TG-1 band assembly ❽ does not get caught.

Note 2:

The band will be loose except for READY mode.

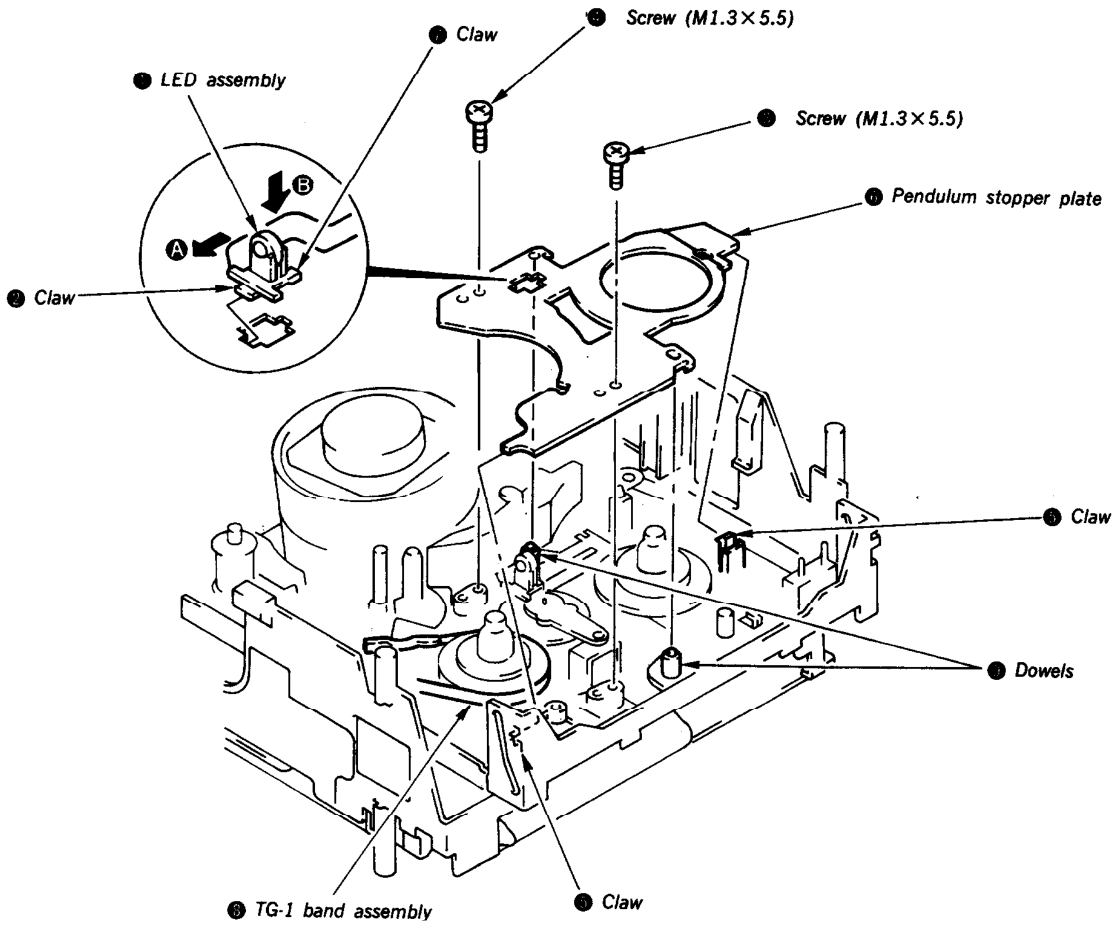

❼ Claw
❸ Screw (M1.3×5.5)
❶ LED assembly
❹ Screw (M1.3×5.5)
Ⓑ
Ⓐ
❻ Pendulum stopper plate
❷ Claw
❺ Claw
❾ Dowels
❽ TG-1 band assembly
❺ Claw

Fig. 13.

3-3. S Reel Table Assembly (Fig. 14)

1. Removal

1) Refer to 1-1. and 1-2. and remove the cassette arm assembly and LS cassette compartment assembly.
2) Refer to 3-1. and remove the reel lock lever assembly.
3) Refer to 3-2. and remove the pendulum stopper plate.
4) Remove screw ❶ and remove one side of TG-1 band assembly ❷.
5) Move soft brake ❸ in the direction of arrow Ⓐ.
6) Remove S reel table assembly ❹.

Note:

Hold the portion of the reel claw marked * to remove S reel table assembly ❹. (Do the same when mounting.)

2. Mounting

1) As shown in Fig. A, apply more than ⅓ but less than ½ drop of oil to the section of shaft ❺ indicated by the arrow.
2) Move soft brake ❸ in the direction of arrow Ⓐ.
3) Mount S reel table assembly ❹ on shaft ❺.
4) Mount TG-1 band assembly ❷ with screw ❶.
5) Refer to 3-2. and mount the pendulum stopper plate.
6) Refer to 3-1. and mount the reel lock lever assembly.
7) Refer to 1-1. and 1-2. and mount the cassette arm assembly and LS cassette compartment assembly.

Note:

Check reel tabel height by referring to 3-26.

Perform tension regulator position adjustment by referring to 3-28.

Perform FWD back tension adjustment by referring to 3-29.

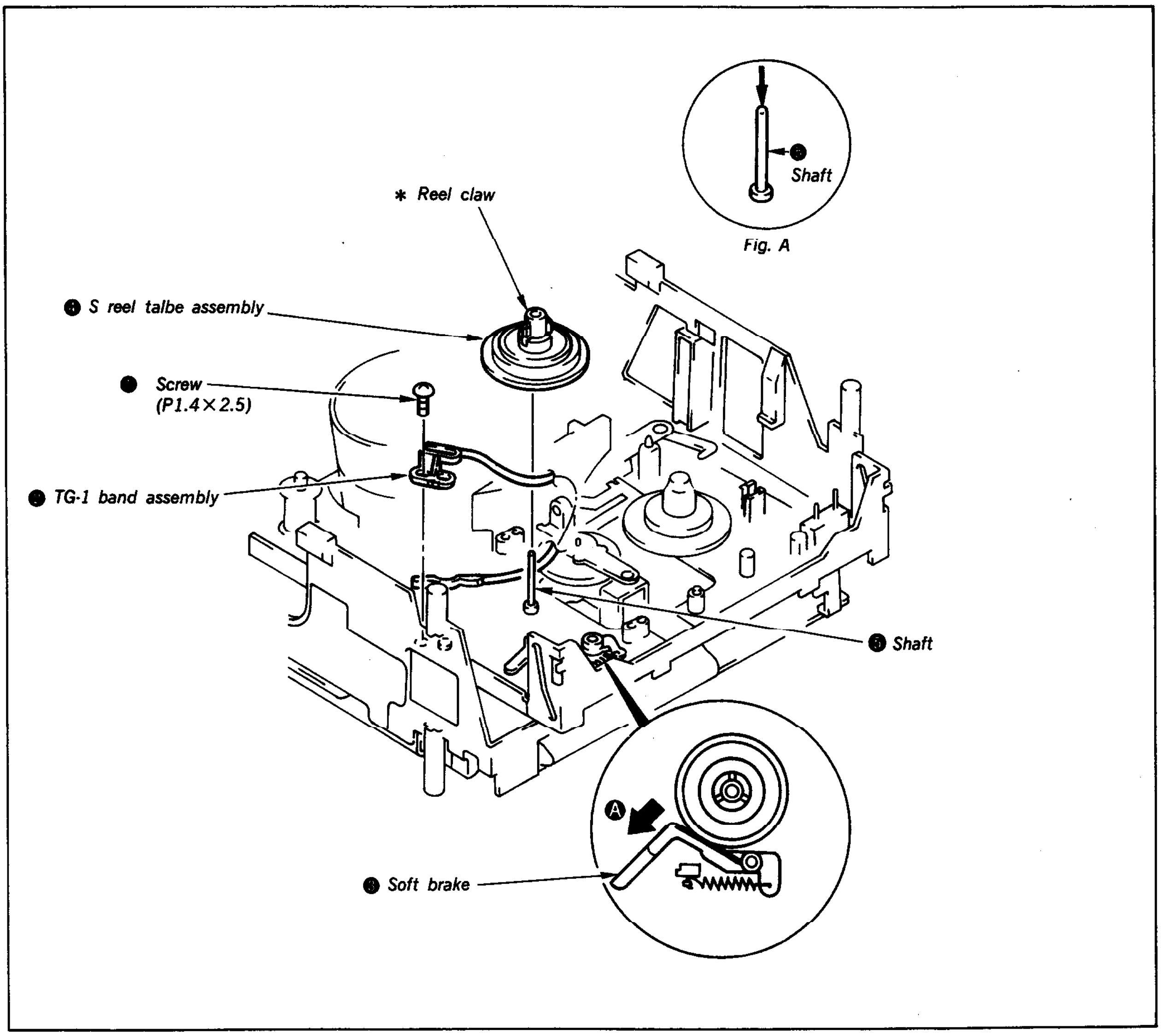


Fig. 14.

3-4. T Reel Table Assembly (Fig. 15)

1. Removal

1) Refer to 1-1. and 1-2. and remove the cassette arm assembly and LS cassette compartment assembly.
2) Refer to 3-1. and remove the reel lock lever assembly.
3) Refer to 3-2. and remove the pendulum stopper plate.
4) Remove T reel table assembly ❶.

   Note:

   Hold the portion of the reel claw marked * to remove T reel table assembly ❶. (Do the same when mounting.)

2. Mounting

1) As shown in Fig. A, apply more than ⅓ but less than ½ drop of oil to the section of shaft ❷ indicated by the arrow.
2) Mount T reel table assembly ❶ on shaft ❷.
3) Refer to 3-2. and mount the pendulum stopper plate.
4) Refer to 3-1. and mount the reel lock lever assembly.
5) Refer to 1-1. and 1-2. and mount the cassette arm assembly and LS cassette compartment assembly.

   Note:

   Check reel table height by referring to 3-26.

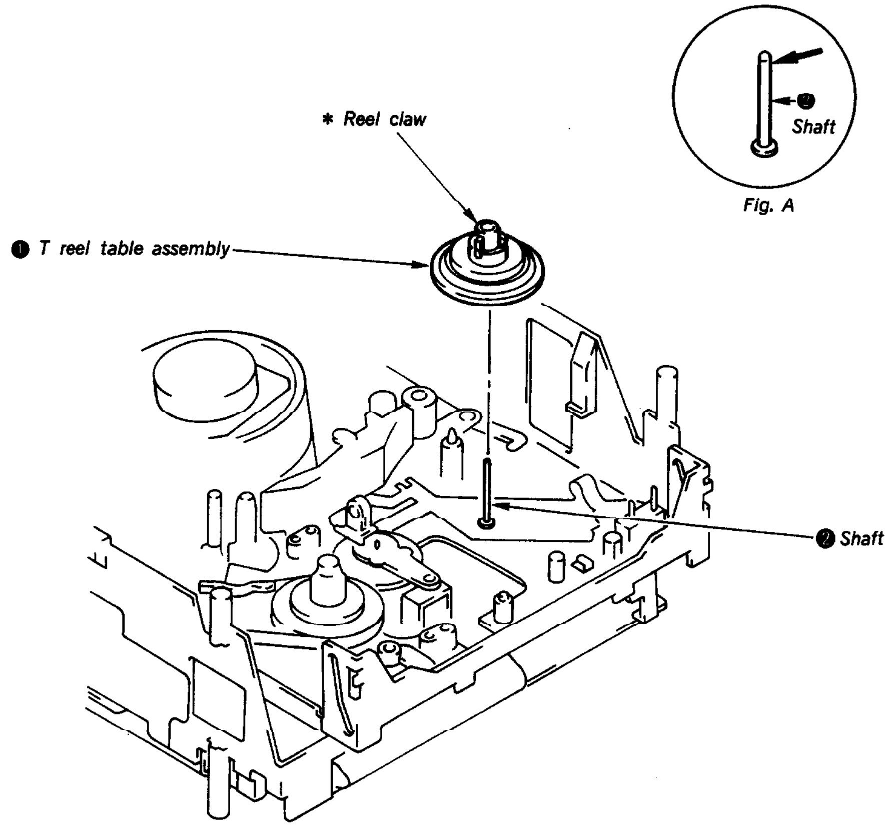


Fig. 15.

3-5. Pinch Arm B Assembly (Fig. 16)

1. Removal

1) Refer to 1-1. and 1-2. and remove the cassette arm assembly and LS cassette compartment assembly.
2) Refer to 3-1. and remove the reel lock lever assembly.
3) Refer to 3-2. and remove the pendulum stopper plate.
4) Refer to 3-4. and remove the T reel table assembly.
5) Remove tension coil spring ❶ from claw ❷.
6) Remove stopper washer ❸ and pinch arm B assembly ❹.

2. Mounting

1) As shown in Fig. A, apply molten grease to the section of pinch arm B assembly ❹ indicated by the arrow.
2) As shown in Fig. B, apply more than ⅓ but less than ½ drop of oil to the section of shaft ❺ indicated by the arrow.
3) Mount pinch arm B assembly ❹ on shaft ❺ so that the pin goes into hole ❻ and pinch arm A ❼ as illustrated in Fig. C.
4) Mount stopper washer ❸.
5) Hook tension coil spring ❶ on claw ❷.
6) Refer to 3-4. and mount the T reel table assembly.
7) Refer to 3-2. and mount the pendulum stopper plate.
8) Refer to 3-1. and mount the reel lock lever assembly.
9) Refer to 1-1. and 1-2. mount the cassette arm assembly and LS cassette compartment assembly.

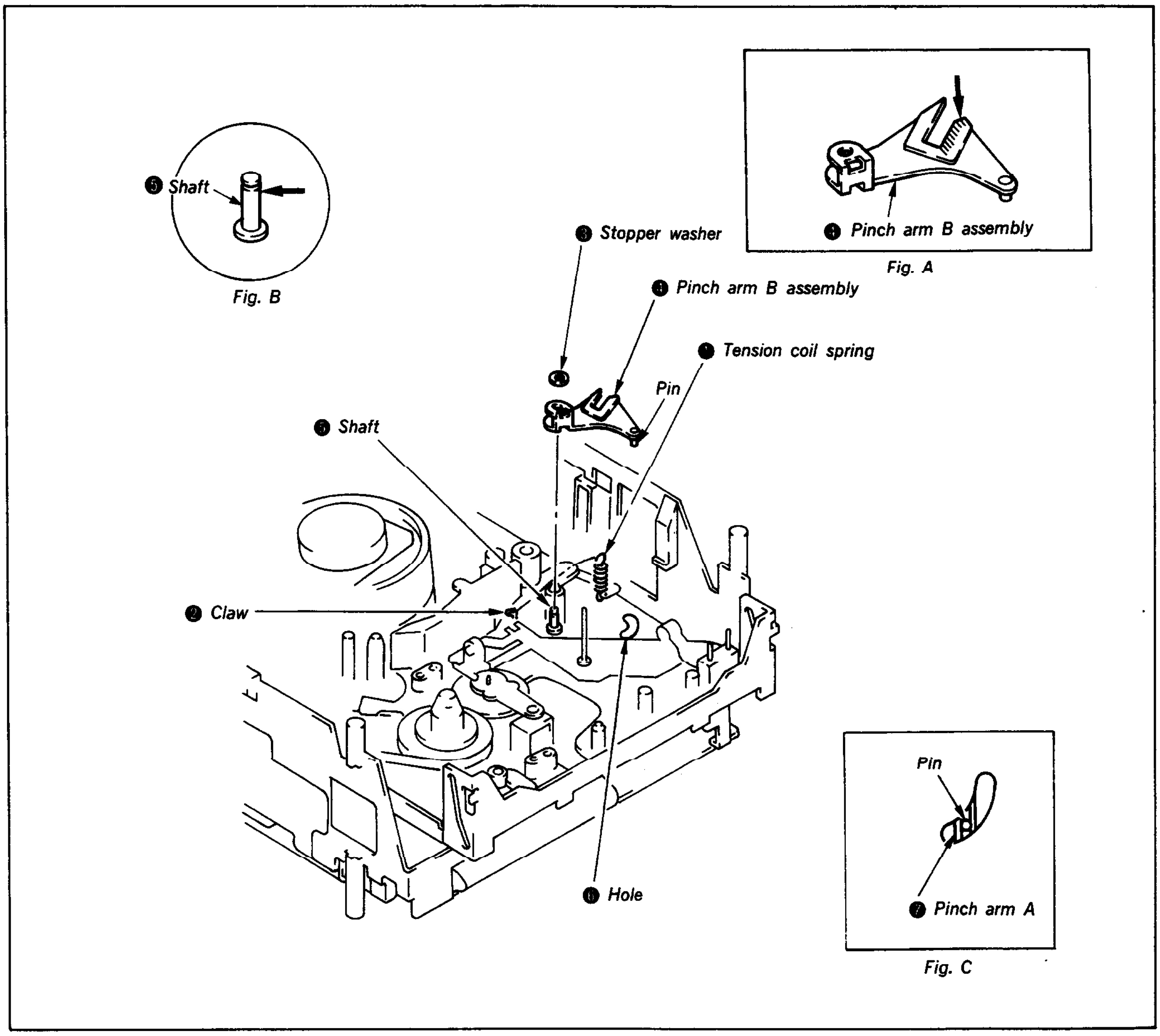

❺ Shaft
❸ Stopper washer
❹ Pinch arm B assembly
❹ Pinch arm B assembly
❶ Tension coil spring
Pin
❺ Shaft
❷ Claw
❻ Hole
Pin
❼ Pinch arm A

Fig. B

Fig. A

Fig. C

Fig. 16.

3-6. Pinch Arm C Assembly (Fig. 17)

1. Removal

1) Refer to 1-1. and 1-2. and remove the cassette arm assembly and LS cassette compartment assembly.
2) Refer to 3-1. and remove the reel lock lever assembly.
3) Refer to 3-2. and remove the pendulum stopper plate.
4) Remove tension coil spring ❶ from claw ❷.
5) Remove stopper washer ❸ and pinch arm C assembly ❹ and pinch lever assembly ❺.
6) Remove tension coil spring ❻ and disassembly pinch arm C assembly ❹ and pinch lever assembly ❺.

   Note:

   Be careful not to touch the roller, marked *.

2. Mounting

1) As shown in Fig. A, apply more than ⅓ but less than ½ drop of oil to the section of shaft ❼ indicated by the arrow.
2) Mount pinch lever assembly ❺ on pinch arm C assembly ❹, being careful not to touch the roller, and hook tension coil spring ❻.
3) Mount pinch arm C assembly ❹ and pinch lever assembly ❺ on shaft ❼.
4) Mount stopper washer ❸.
5) Hook tension coil spring ❶ on claw ❷.
6) Refer to 3-2. and mount the pendulum stopper plate.
7) Refer to 3-1. and mount the reel lock lever assembly.
8) Refer to 1-1. and 1-2. and mount the cassette arm assembly and LS cassette compartment assembly.

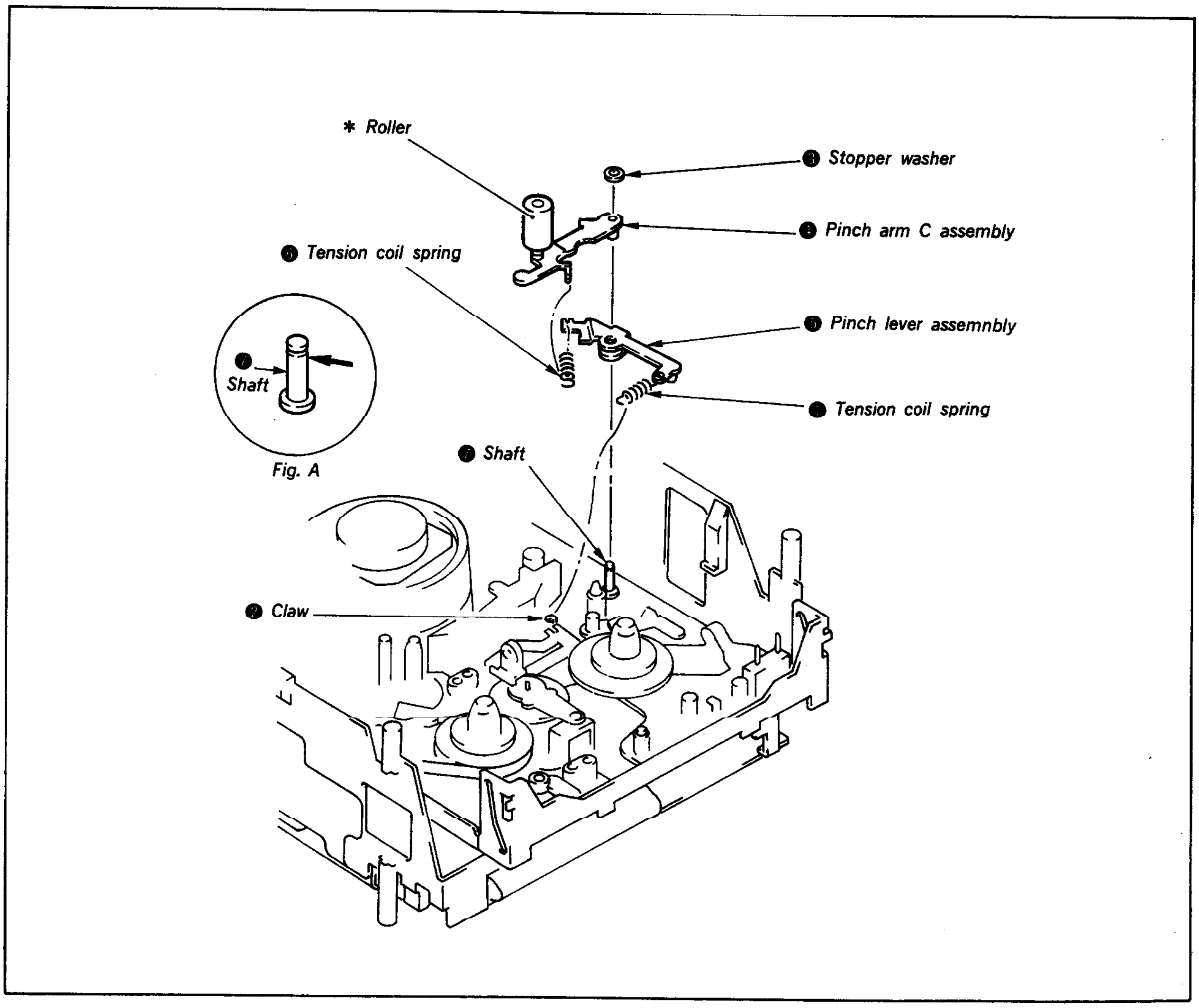

* Roller
❸ Stopper washer
❹ Pinch arm C assembly
❻ Tension coil spring
❺ Pinch lever assemnbly
❼ Shaft
❶ Tension coil spring
Fig. A
❼ Shaft
❷ Claw

Fig. 17.

3-7. TG-1 Arm Assembly (Fig. 18.)

1. Removal

1) Refer to 1-1. and 1-2. and remove the cassette arm assembly and LS cassette compartment assembly.
2) Refer to 3-1. and remove the reel lock lever assembly.
3) Refer to 3-2. and remove the pendulum stopper plate.
4) Remove stopper washer ❶ and screw ❷.
5) Remove tension coil spring ❸ and TG-1 arm assembly ❹.
   Note:
   Be careful not to touch the shoe, marked ＊ and the guide, also marked ＊. (Fig. 19.)

2. Mounting

1) As shown in Fig. A. apply more than ⅓ but less than ½ drop of oil to the section of shaft ❺ indicated by the arrow.
2) Mount TG-1 arm assembly ❹ on shaft ❺, being careful not to touch the guide.
3) Wind TG-1 band assembly ❼ around the outer circumference of S reel table assembly ❻ and mount with screw ❷ after lining up to the dowel.
4) Mount stopper washer ❶.
5) Hook tension coil spring ❸ as shown in Fig.B.
6) Refer to 3-2. and mount the pendulum stopper plate.
7) Refer to 3-1. and mount the reel lock lever assembly.
8) Refer to 1-1. and 1-2. and mount the cassette arm assembly and LS cassette compartment assembly.
   Note 1:
   Be careful that the TG-1 band assmbly ❼ is not bent.
   Note 2:
   Perform tension regulator position adjustment, referring to 3-28.
   Note 3:
   Perform FWD back tension adjustment, referring to3-29.

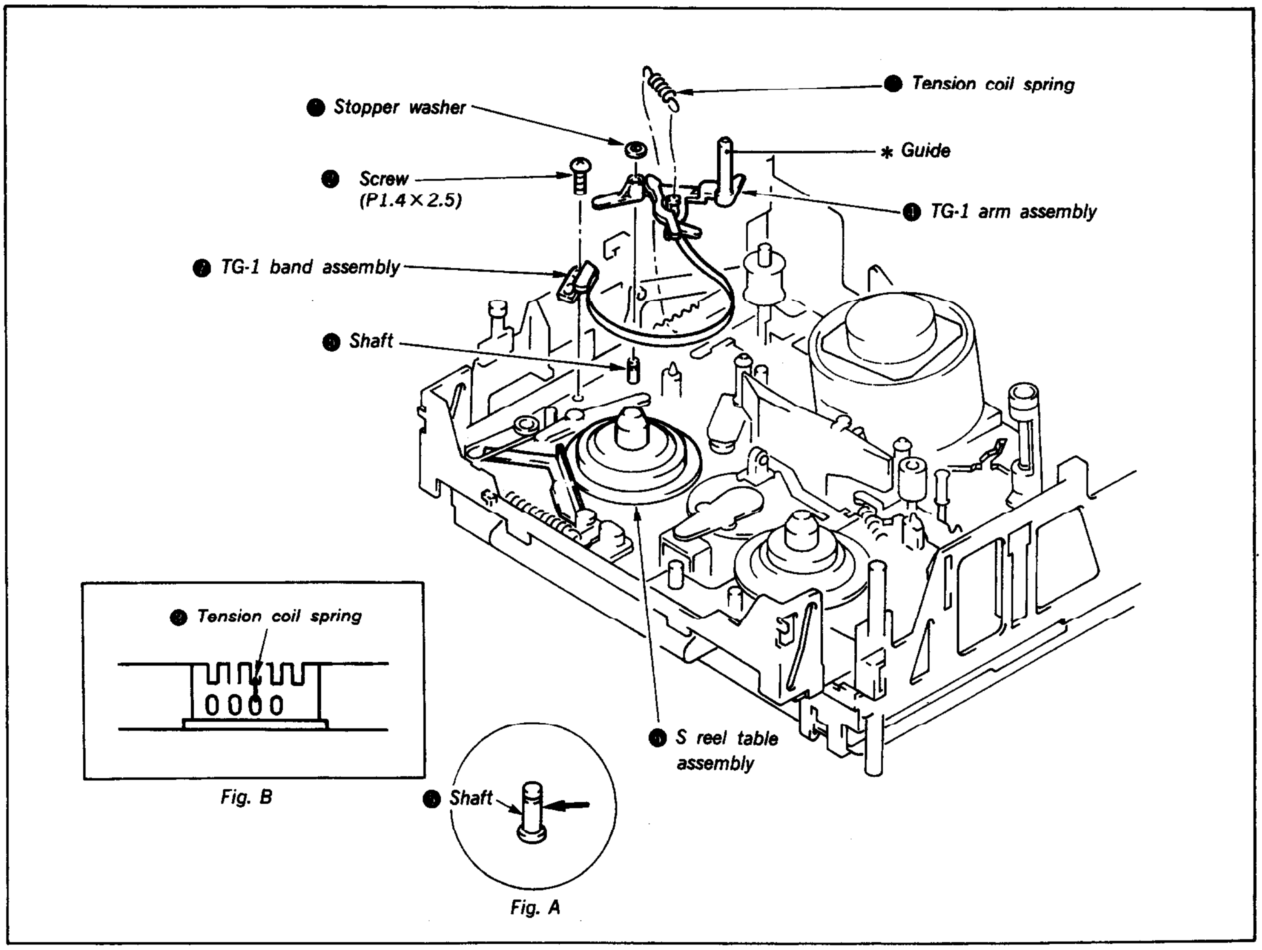

❶ Stopper washer
❷ Screw (P1.4×2.5)
❼ TG-1 band assembly
❺ Shaft
❸ Tension coil spring
＊ Guide
❹ TG-1 arm assembly
❻ S reel table assembly
❸ Tension coil spring
Fig. B
❺ Shaft
Fig. A

Fig. 18.

3-8. TG-1 Band Assembly (Fig. 19.)

1. Removal

1) Refer to 3-7. and remove the TG-1 arm assembly ❸.
2) Remove TG-1 band assembly ❶ claw ❷ from TG-1 arm assembly ❸ hole.

2. Mounting

1) Insert TG-1 band assembly ❶ claw ❷ in TG-1 arm assembly ❸ hole.
2) Confirm that TG-1 band assembly ❶ rotates smoothly around TG-1 arm assembly ❸ hole.
3) Refer to 3-7. and mount TG-1 arm assembly ❸.

Note 1:

Be careful that the TG-1 band assembly ❶ is not bent.

Note 2:

Be careful not to touch the shoe, marked * , and the guide, also marked *.

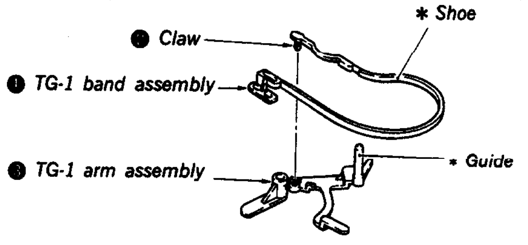


Fig. 19.

3-9. Soft Brake Assembly (Fig.20.)

1. Removal

1) Refer to 1-1. and 1-2. and remove the cassette arm assembly and LS cassette compartment assembly.
2) Refer to 3-1. and remove the reel lock lever assembly.
3) Refer to 3-2. and remove the pendulum stopper plate.
4) Remove tension coil spring ❶ from claw ❷.
5) Remove soft brake assembly ❸.

2. Mounting

1) Mount soft brake assembly ❸. Insert section Ⓐ under LS plate spring ❹.
2) Hook tension coil spring ❶ onto claw ❷.
3) Refer to 3-2. and mount the pendulum stopper plate.
4) Refer to 3-1. and mount the reel lock lever assembly.
5) Refer to 1-1. and 1-2. and mount the cassette arm assembly and LS cassette compartment assembly.

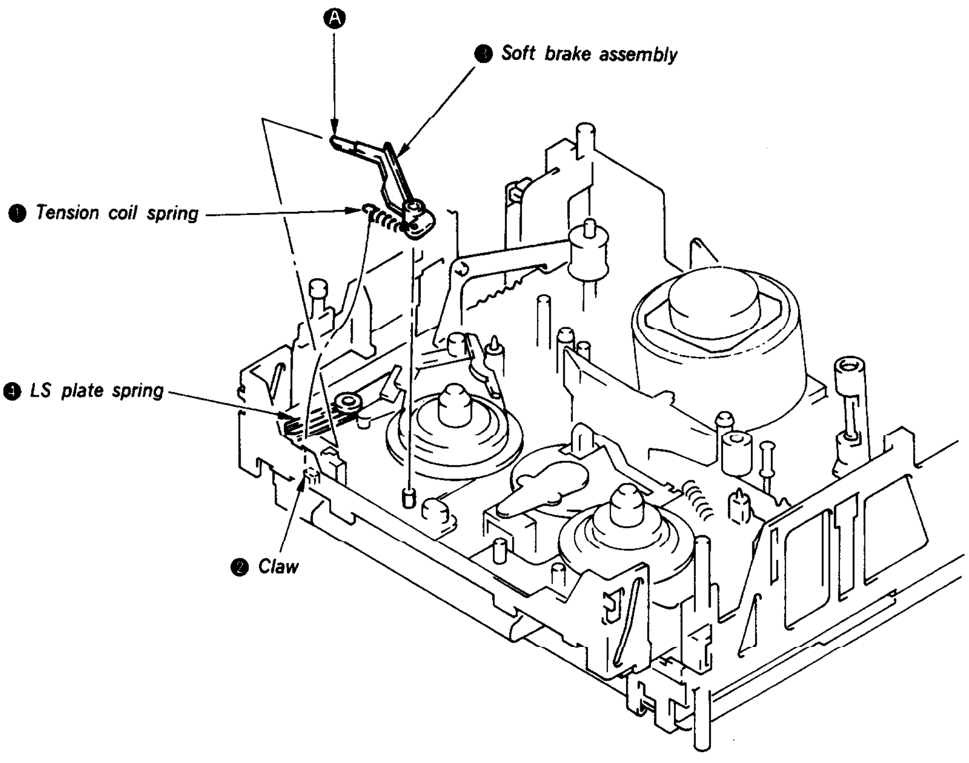


Fig. 20.

3-10. LS Chassis Assembly (Fig. 21.)

1. Removal

1) Refer to 1-1. and 1-2. and remove the cassette arm assembly and LS cassette compartment assembly.
2) Put into BLANK after GUIDE LOAD mode.
3) Remove stopper washer ❶.
4) Remove the three screws ❷ and LS guides. ❸.
5) Remove LS chassis assembly ❹ in the direction of arrow 🅐.
6) Unsolder the nine locations on flexible board ❺ indicated in Fig. A with a soldering iron, and remove flexible board ❺, which is stuck onto the mechanical chassis.

2. Mounting

1) Remove the tape on the back of a new flexible board ❺ and stick on to the mechanical chassis, lining up to the shaft and pattern.
2) Solder the nine locations on flexible board ❺ as shown in Fig. B.
3) Apply grease to the portion of LS chassis assembly ❹ indicated by the arrow, as shown in Fig. C.
4) Move reel lock lever assembly ❻ in the direction of arrow 🅔, and mount LS chassis assembly ❹ by lining up the four mounting holes to the mechanical chassis shafts.
5) Engage the two claws ❼ with the drum base.
6) Move TG-7 arm assembly ❽ in the direction of arrow 🅕 (move gently with tweezers, etc.) and insert into the mechanical chassis hole.
7) As shown in Fig. D, inser LS gear assembly pin ❿ into the LS cam plate long hole ❾.
8) Insert pinch arm B pin into pinch arm A long hole.
9) Insert TS arm ⓫ into pinch arm A ⓬ U groove.
10) Confirm that reel lock lever assembly ❻ does not ride up on reel lock lever B ⓭.
11) Confirm that TG-1 release arm ⓮ does not ride up on M slider ⓯.
12) Confirm that the pendulum gear arm assembly ⓰ pin can be seen through the pendulum stopper plate ⓱ hole.

    Note:

    Confirm that the mechanical chassis assembly parts are assembled correctly.
13) After confirming correct assembly, mount LS guides ❸ and screw ❷.
14) Mount stopper washer ❶.
15) Use the mode selector and confirm that loading and threading are performed smoothly.
16) Refer to 1-1. and 1-2. and mount the cassette arm assembly and LS cassette compartment assembly.

    Note:

    Perform soldering quickly.

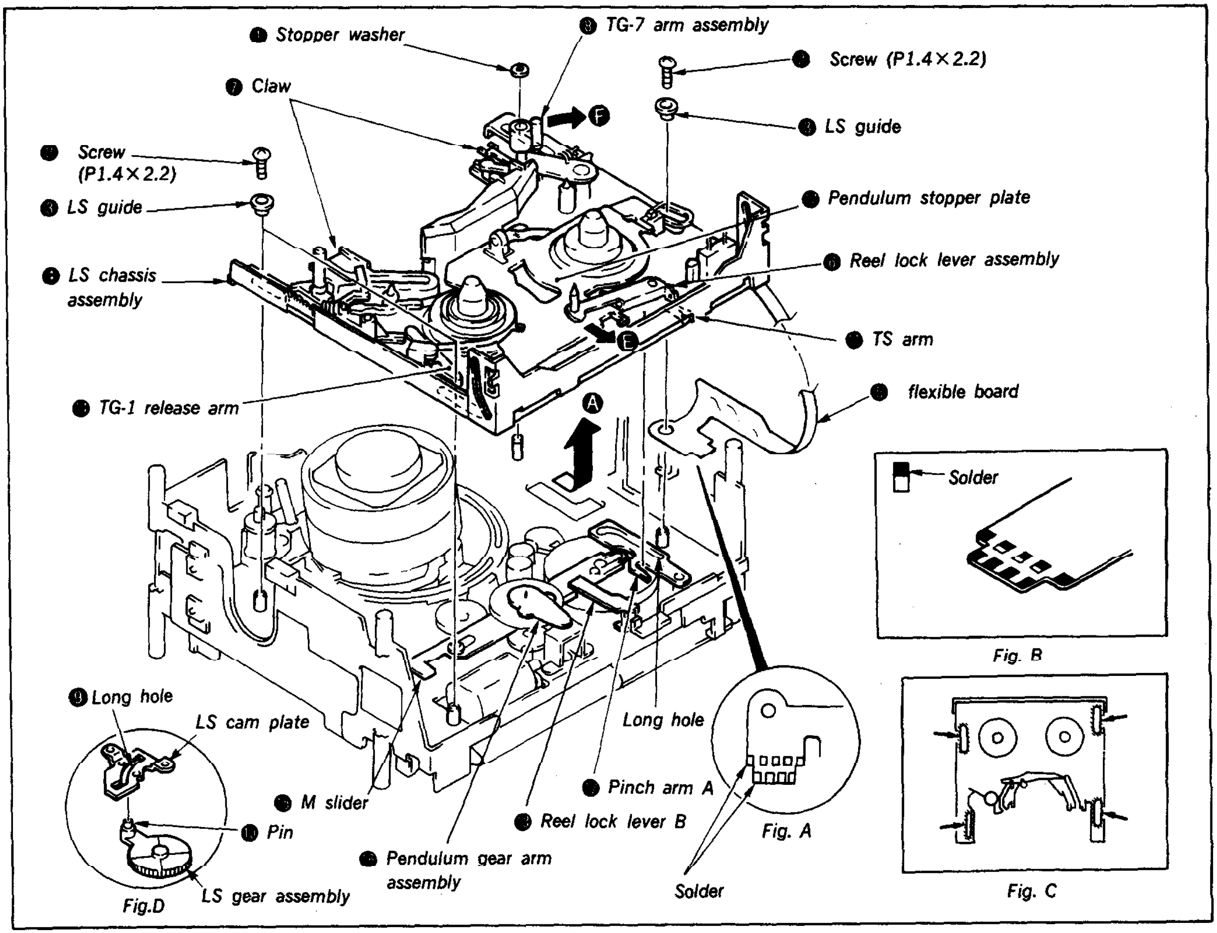

❶ Stopper washer
❽ TG-7 arm assembly
❷ Screw (P1.4×2.2)
❼ Claw
🅕
❸ LS guide
❷ Screw (P1.4×2.2)
❸ LS guide
⓱ Pendulum stopper plate
❹ LS chassis assembly
❻ Reel lock lever assembly
🅔
⓫ TS arm
❺ flexible board
⓮ TG-1 release arm
🅐
Solder
Fig. B
❾ Long hole
LS cam plate
Long hole
⓯ M slider
⓬ Pinch arm A
❿ Pin
⓭ Reel lock lever B
Fig. A
⓰ Pendulum gear arm assembly
Fig.D
LS gear assembly
Solder
Fig. C

Fig. 21.

3-11. TG-7 Arm Assembly (Fig. 22)

1. Removal

1) Refer to 1-1. and 1-2. and remove the cassette arm assembly and LS cassette compartment assembly.
2) Refer to 3-10. and remove the LS chassis assembly.
3) Turn the LS chassis assembly over.
4) Remove stopper washer ● (t=0.3mm).
5) Remove TG-7 spring ● from hook ● and remove the TG-7 arm assembly ●.

   Note 1:

   Be careful not to bend the * flexible board which is attached to the chassis.

   Note 2:

   Be careful not to bend the TG-7 arm.

2. Mounting

1) As shown in Fig. A, apply more than ⅓ but less than ½ drop of oil to the section of the shaft indicated by the arrow.
2) Mount TG-7 arm assembly ● via TG-7 spring ●.
3) Hook TG-7 spring ● on claw ●.
4) Mount stopper washer ●.
5) Refer to 3-10. and mount the LS chassis assembly.
6) Refer to 1-1. and 1-2. and mount the cassette arm assembly and LS cassette compartment assembly.
7) Perform guide height adjustment, referring to 4. Tape Path Adjustment.

   Note:

   Confirm that stopper washer ● is completely in the shaft groove.

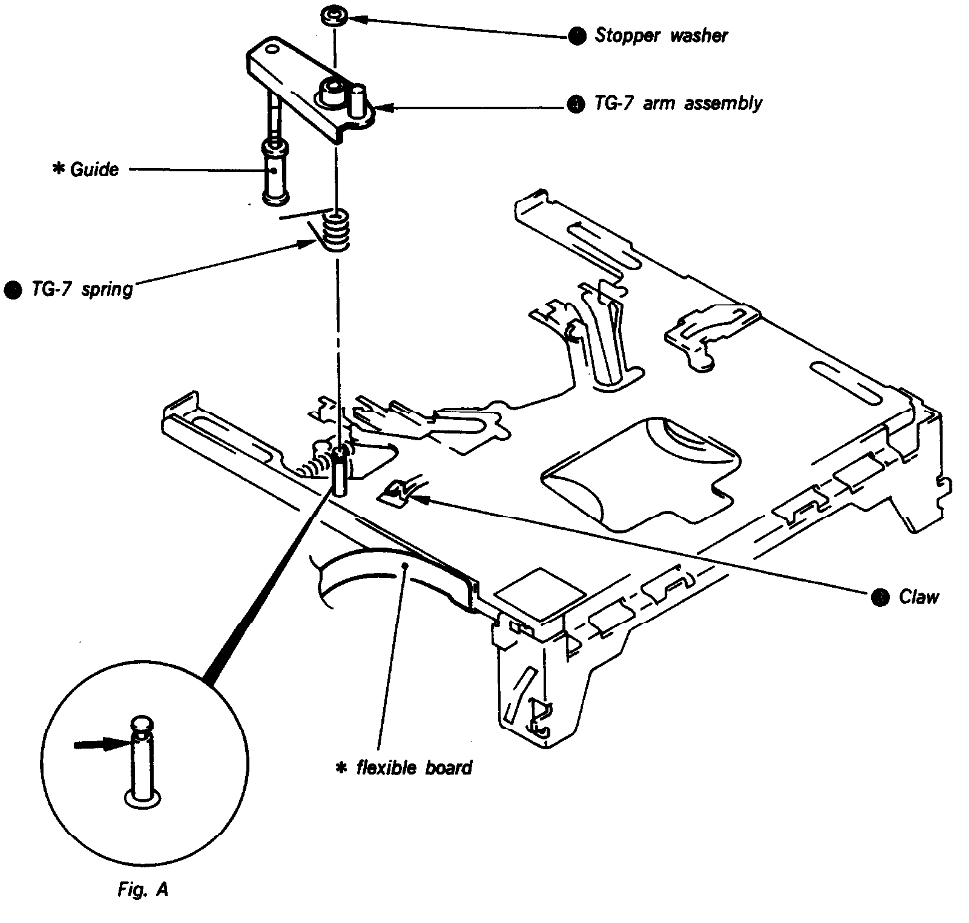


Fig. 22.

3-12. Pinch Arm A Assembly (Fig. 23)

1. Removal

1) Refer to 1-1. and 1-2. and remove the cassette arm assembly and LS cassette compartment assembly.
2) Refer to 3-10. and remove the LS chassis assembly.
3) Remove stopper washer ❶.
4) Remove pinch arm A assembly ❷.

2. Mounting

1) As shown in Fig. A, apply more than ⅓ but less than ½ drop of oil to the section of the shaft indicated by the arrow.
2) As shown in Fig. B, apply grease to the section of pinch arm A assembly ❷ indicated by the arrow.
3) Insert pinch arm A assembly ❷ pin in the cam assembly ❸ outer groove and mount on the shaft.
4) Mount stopper washer ❶.
5) Refer to 3-10. and mount the LS chassis assembly.
6) Refer to 1-1. and 1-2. and mount the cassette arm assembly and LS cassette compartment assembly.

Note:

Confirm that stopper washer ❶ is completely in the shaft groove.

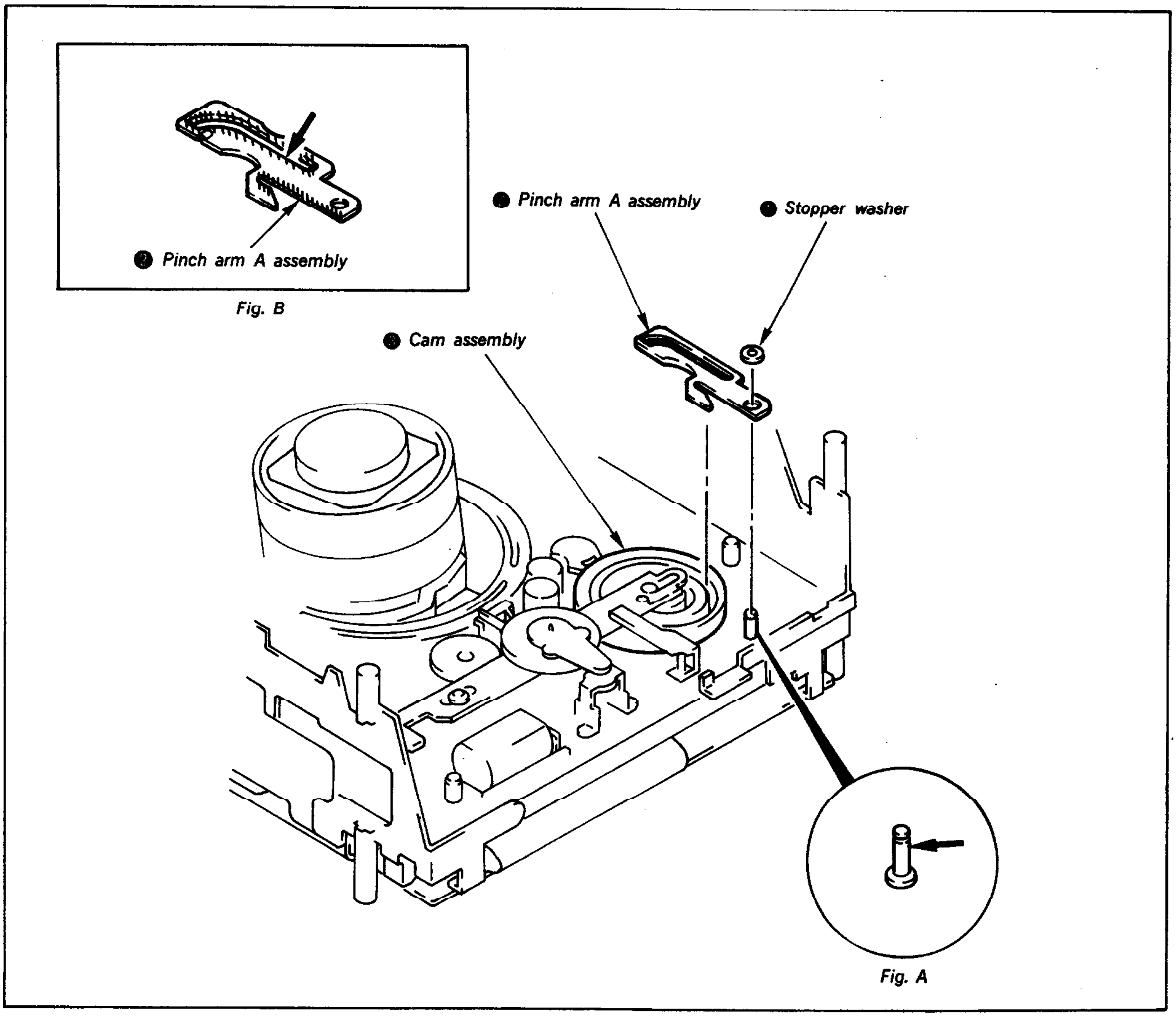


Fig. 23.

3-13. M Slider Assembly (Fig. 24)

1. Removal

1) Refer to 1-1. and 1-2. and remove the cassette arm assembly and LS cassette compartment assembly.
2) Refer to 3-10. and remove the LS chassis assembly.
3) Remove pendulum gear arm ❶.
4) Remove E ring ❷ and reel lock lever B ❸.
5) Remove stopper washer ❹.
6) Remove stopper washer ❺ and M slider assembly ❻.

2. Mounting

1) As shown in Fig. A, apply grease to the section of M slider assembly ❻ indicated by the arrow.
2) Insert M slider assembly ❻ pin into cam assembly ❼ inner groove and mount.
3) Mount stopper washers ❺ and ❹.
4) As shown in Fig. B, apply grease to the portion of reel lock lever B ❸ indicated by the arrow.
5) As shown in Fig. C and E, apply more than ⅓ drop but less than ½ drop of oil to the portions of the shafts indicated by the arrows.
6) As shown in Fig. D, mount reel lock lever B so that it is between the protrusion and the pin.
7) Mount E ring ❷.
8) Apply more than ⅓ but less than ½ drop of oil to the relay base assembly ❾ shaft outer circumference.
9) Mount pendulum gear arm ❶.
10) Refer to 3-10. and mount the LS chassis assembly.
11) Refer to 1-1. and 1-2. and mount the cassette arm assembly and LS cassette compartment assembly.

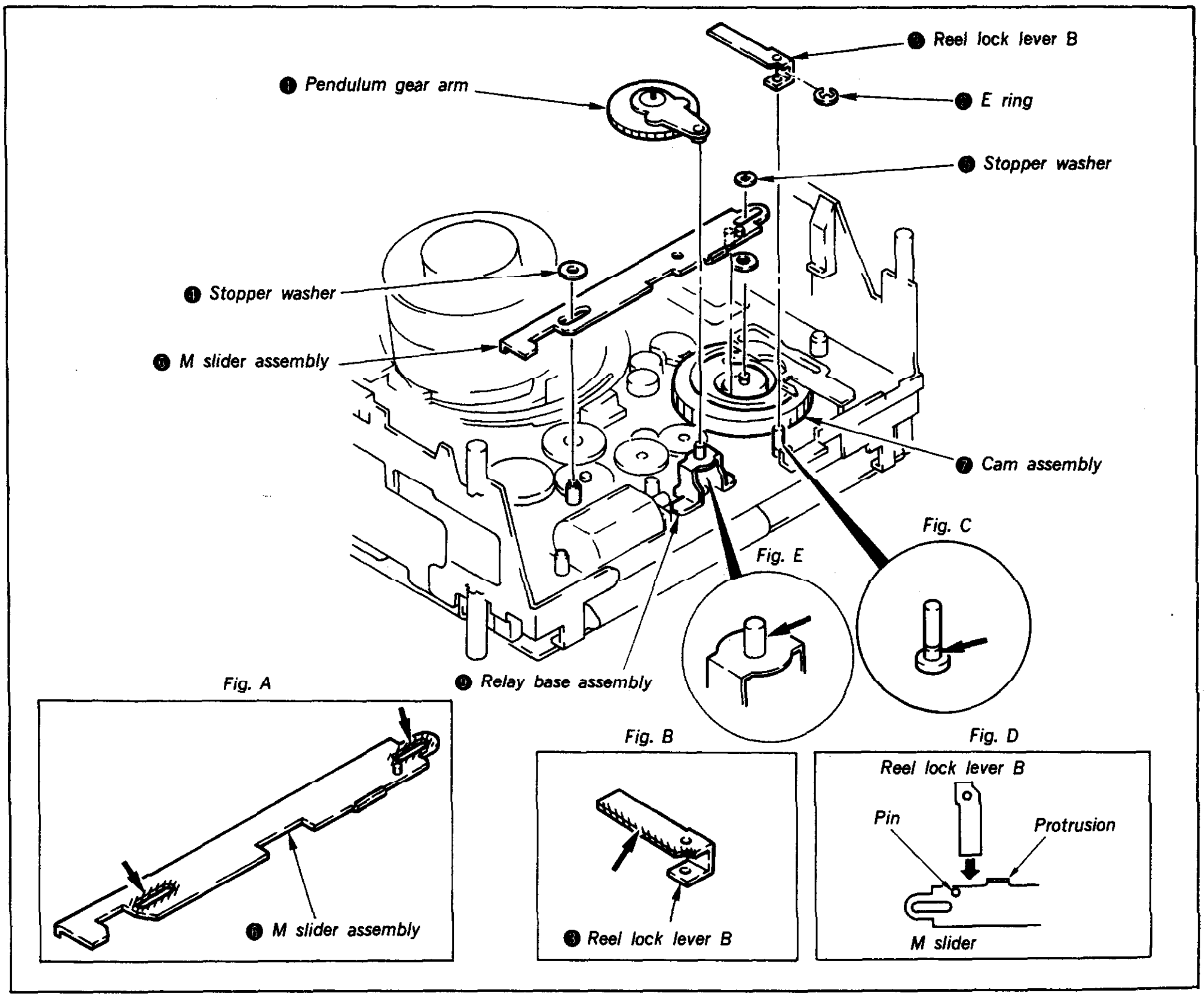

❸ Reel lock lever B
❶ Pendulum gear arm
❷ E ring
❹ Stopper washer
❺ Stopper washer
❻ M slider assembly
❼ Cam assembly
Fig. C
Fig. E
Fig. A
❾ Relay base assembly
Fig. B
Fig. D
Reel lock lever B
Pin
Protrusion
M slider
❻ M slider assembly
❸ Reel lock lever B

Fig. 24.

3-14. TG-4 Base Assembly, TG-5 Base Assembly

1. Removal

1) Refer to 1-1. and 1-2. remove the cassette arm assembly and LS cassette compartment assembly.
2) Refer to 3-10. and remove the LS chassis assembly.
3) Set for GUIDE LOAD mode and remove TG-4 base assembly ❶ and TG-5 base assembly ❷ from the drum base groove.
4) Rotate the top of pin ❺ in the direction of arrow Ⓐ around TG-4 base assembly ❶ pin ❹ and remove from the notch ❸. (Fig. 25.)
5) Remove pin ❹ from notch ❸ hole.
6) Move TG-5 base assembly ❷ in the direction of arrow Ⓐ and remove from notch ❼. (Fig. 26.)
7) Remove TG-5 base assembly ❷ from pin ❻ (Fig. 27.)

Note:

Be careful not to touch the guide, marked *.

2. Mounting

1) Insert pin ❻ into TG-5 base assembly ❷ hole.
2) Move TG-5 base assembly ❷ in the direction of arrow Ⓑ and insert under notch ❼.
3) Insert TG-4 base assembly ❶ pin ❹ into notch ❸ hole.
4) Rotate TG-4 base assembly ❶ pin ❺ in the direction of arrow Ⓑ and insert into notch ❸.
5) Confirm that TG-4 base assembly ❶ and TG-5 base assembly ❷ are mounted as shown in Fig. A and B respectively.
6) While slowly setting to BLANK after GUIDE LOAD mode, insert TG-4 base assembly ❶ and TG-5 base assembly ❷ into the drum base groove.
   If the positioning is wrong, they will catch on the drum base groove entrance and stop moving, so be sure to insert carefully into the drum base groove.
7) Refer to 3-10. and mount the LS chassis assembly.
8) Refer to 1-1. and 1-2. and mount the cassette arm assembly and LS cassette compartment assembly.

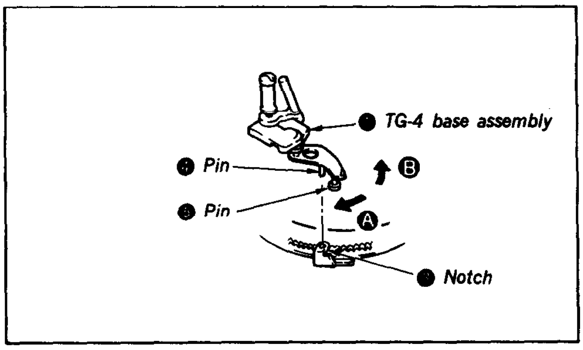


Fig. 25.

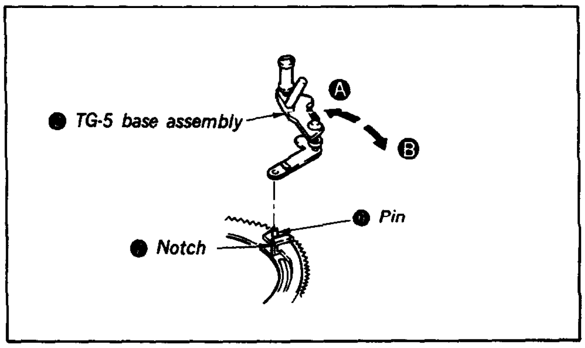


Fig. 26.

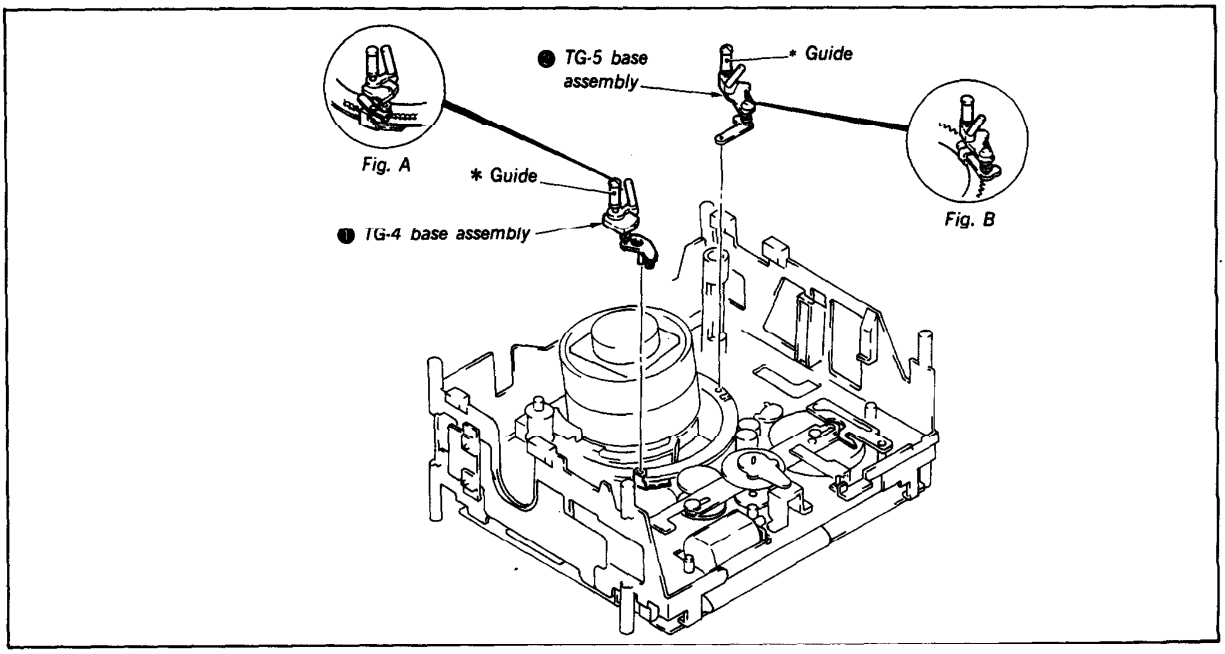


Fig. 27.

3-15. Loading Slider T Assembly (Fig.28.)

1. Removal

1) Refer to 1-1. and 1-2. and remove the cassette arm assembly and LS cassette compartemet assembly.
2) Refer to 3-10. and remove the LS chassis assembly.
3) Refer to 3-14. and remove the TG-4 base assembly and TG-5 base assembly.
4) Refer to 3-24. and remove the drum unit.
5) Remove screw ❶, plate spring T ❷ and T slider stopper ❸.
6) Remove screw ❹ and slider support ❺.
7) Remove the two stopper washers ❻ and loading slider T assembly ❼.

2. Mounting

1) As shown in Fig. A, apply grease to the portion of plate spring T ❷ indicated by the arrow.
2) As shown in Fig. B, apply grease to the portion of loading slider T assembly ❼ indicated by the arrow.
3) Line up loading slider T assembly hole ❽ and loading slider S assembly hole ❾ and mount loading slider T assembly ❼.
4) Mount the two stopper washers.
5) Line up slider support ❺ to the dowel and mount with screw ❹.
6) Mount T slider stopper ❸ plate spring T ❷ with screw ❶.
7) Refer to 3-24. and mount the drum unit.
8) Refer to 3-14. and mount the TG-4 base assembly and TG-5 base assembly.
9) Refer to 3-10. and mount the LS chassis assembly.
10) Refer to 1-1. and 1-2. and mount the cassette arm assembly and LS cassette compartment assembly.

Note 1:

Make sure that stopper washer ❻ is completely in the shaft groove.

Note 2:

After mounting loading slider T assembly ❼, perform phase adjustment, referring to 3-17.

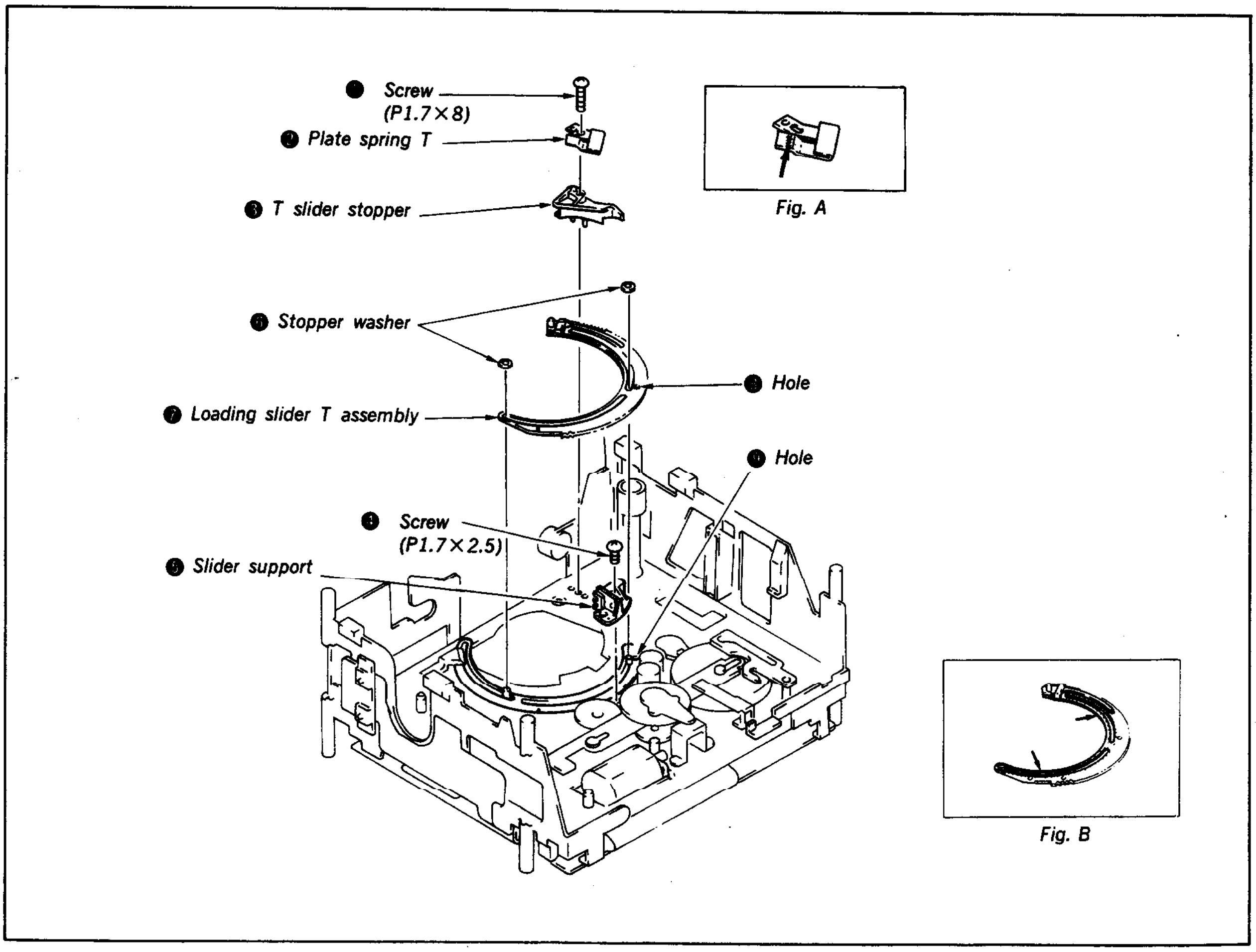


Fig. 28.

3-16. Loading Slider S Assembly (Fig. 29.)

1. Removal

1) Refer to 1-1. and 1-2. and remove the cassette arm assembly and LS cassette compartment assembly.
2) Refer to 3-10. and remove the LS chassis assembly.
3) Refer to 3-14. and remove the TG-4 base assembly and TG-5 base assembly.
4) Refer to 3-24. and remove the drum unit.
5) Refer to 3-15. and remove the loading slider T assembly.
6) Remove screw ❶ and S slider stopper ❷.
7) Remove the two guide rollers ❸ and loading slider S assembly ❹.

2. Mounting

1) As shown in Fig. A, apply a little grease to the portion of shaft ❺ indicated by the arrows.
2) As shown in Fig. B, apply grease to the portions of loading slider S assembly ❹ indicated by the arrows.
3) Line up loading slider S assembly hole ❻ and chassis hole ❼ and mount loading slider S assembly ❹.
4) Mount the two guide rollers ❸.
5) Line up S slider stopper ❷ to the dowel and mount with screw ❶.
6) Refer to 3-15. and mount the loading slider T assembly.
7) Refer to 3-24. and mount the drum unit.
8) Refer to 3-14. and mount the TG-4 base assembly and TG-5 base assembly.
9) Refer to 3-10. and mount the LS chassis assembly.
10) Refer to 1-1. and 1-2. and mount the cassette arm assembly and LS cassette compartment assembly.

Note:

After mounting loading slider T assembly, refer to 3-17. and perform phase adjustment.

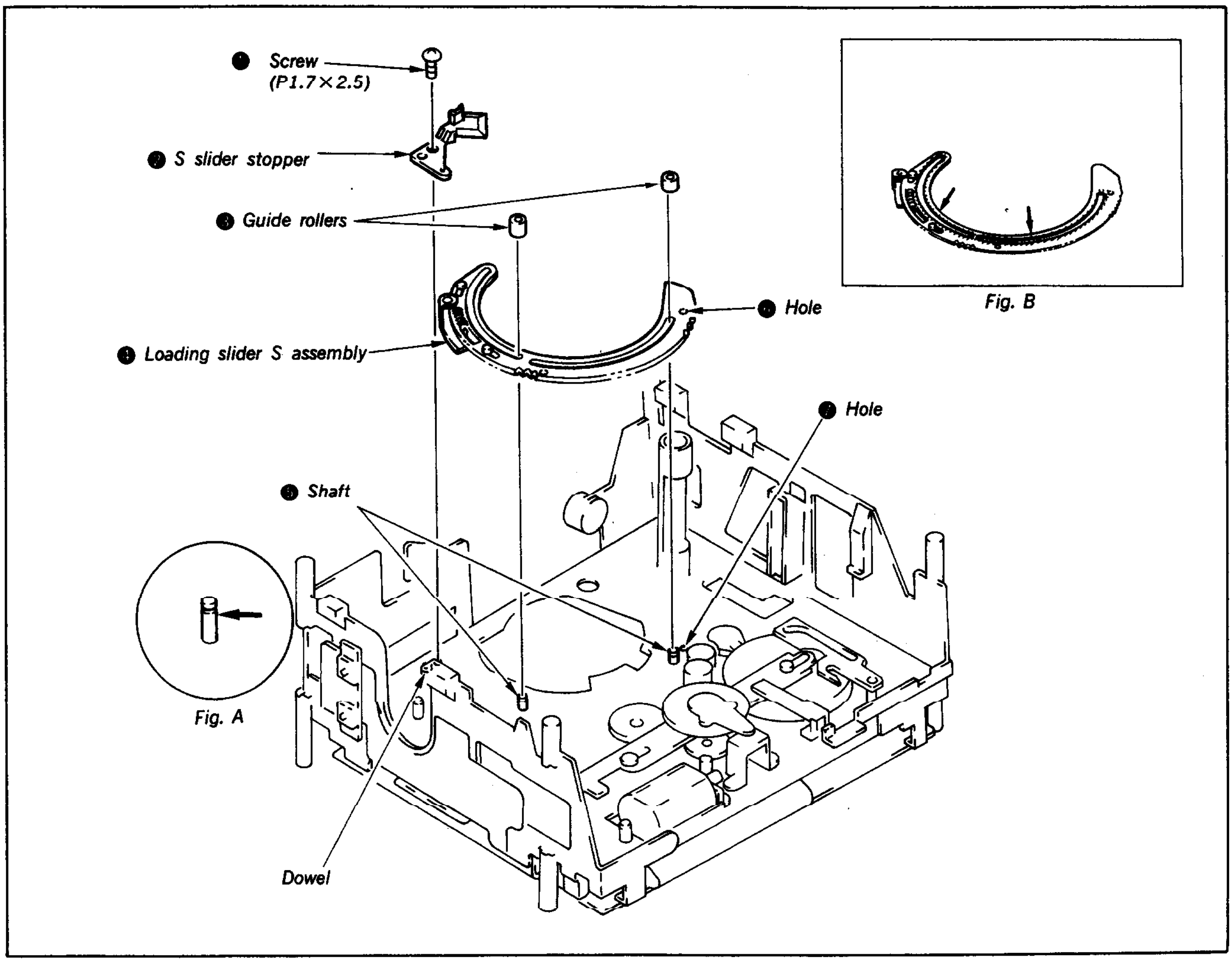


Fig. 29.

3-17. Phase Adjustment (Fig. 30.)

1. Removal

1) Refer to 1-1. and 1-2. and remove the cassette arm assembly and LS cassette compartment assembly.
2) Refer to 3-10. and remove the LS chassis assembly.
3) Refer to 3-14. and remove the TG-4 base assembly and TG-5 base assembly.
4) Refer to 3-24. and remove the drum unit.
5) Remove stopper washer ❿ and loading gear S ❻.
6) Remove stopper washer ❽ and LS gear A ❼.

2. Adjustment

1) Confirm that it is in BLANK after GUIDE LOAD mode.
2) Line up the positions of loading slider T assembly ❷ hole, loading slider S assembly ❸ hole and the hole in the mechanical chassis, and insert a rod ❶ with diameter of 1mm.
3) Line up the positions of LS gear C assembly ❹ hole and the hole in the mechanical chassis, and insert a rod ❶ with diameter of 1mm.
4) As shown in Fig. A, rotate loading gear M ❺ so that the notch of loading gear M ❺ comes to the loading gear S ❻ side.
5) As shown in Fig. B, position and mount LS gear A ❼ so that loading slider T assembly ❷ hole and LS gear A ❼ hole are in a straight line.
6) Mount stopper washer ❽.
7) Mount loading gear S ❻ and stopper washer ❿.

Note:
Make sure that stopper washers ❽ and ❿ are completely in the shaft groove.

3. Mounting

1) As shown in Fig. C, apply grease (amount: about the size of a grain of rice) to the five locations on cam assembly ❾ inside groove.
2) Refer to 3-24. and mount the drum unit.
3) Refer to 3-14. and mount the TG-4 base assembly and TG-5 base assembly.
4) Refer to 3-10. and mount the LS chassis assembly
5) Refer to 1-1. and 1-2. and mount the cassette arm assembly and LS cassette compartment assembly.

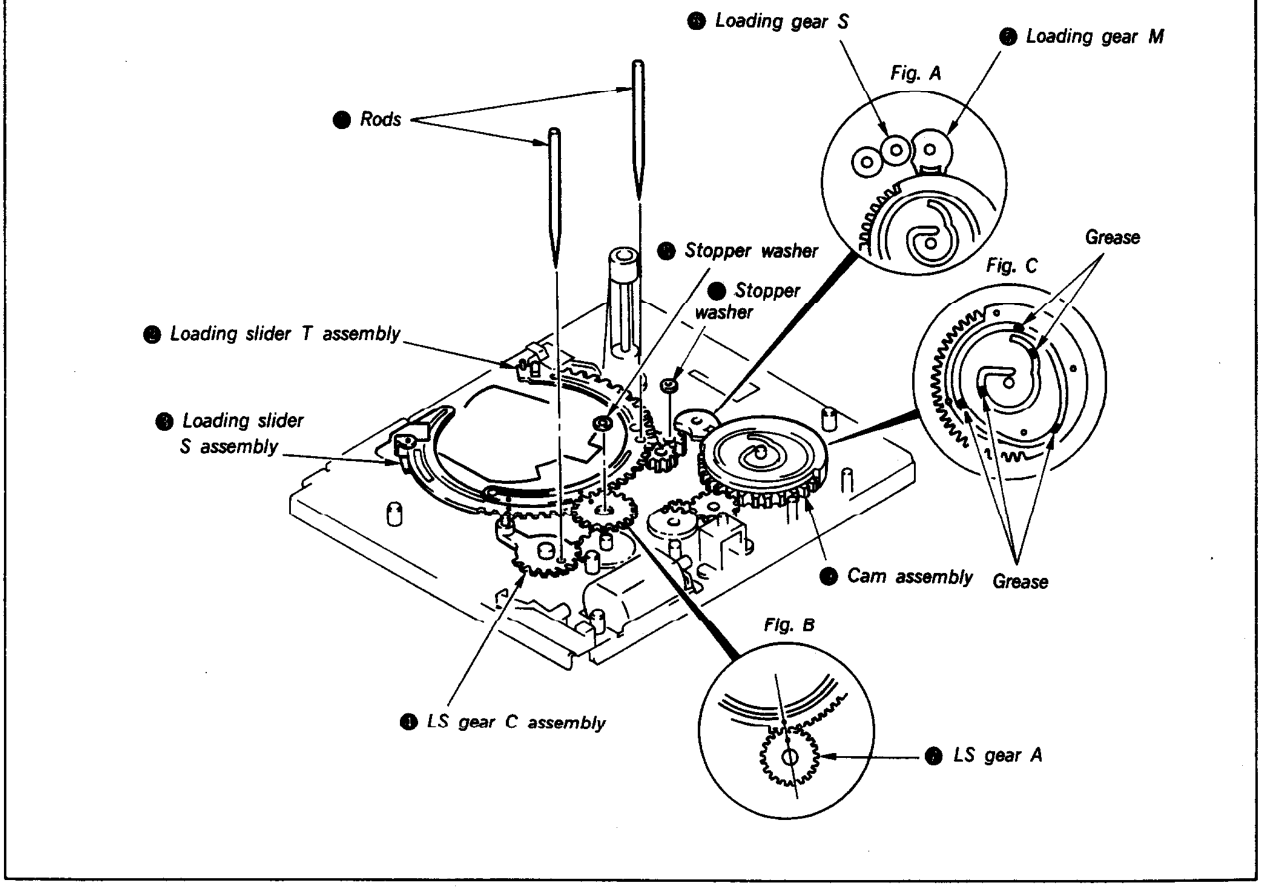

❻ Loading gear S
❺ Loading gear M
Fig. A
❶ Rods
❽ Stopper washer
❿ Stopper washer
Grease
Fig. C
❷ Loading slider T assembly
❸ Loading slider S assembly
❾ Cam assembly
Grease
Fig. B
❹ LS gear C assembly
❼ LS gear A

Fig. 30.

3-18. Gear Tray In Operation Check (Fig. 31.)

1. Removal

1) Refer to 1-1. and 1-2. and remove the cassette arm assembly and LS cassette compartment assembly.
2) Refer to 3-10. and remove the LS chassis assembly.
3) Refer to 3-14. and remove the TG-4 base assembly and TG-5 base assembly.
4) Refer to 3-24. and remove the drum unit.
5) Refer to 3-21. and remove the LM motor assembly.

2. Check

1) Insert the tip of tweezers into cam assembly ❶ hole.
2) Rotate cam assembly ❶ once in the direction of arrow Ⓐ, then once in the direction of arrow Ⓑ. Repeat this operation three times.
3) At this time, check that the gears and sliders indicated in the figure rotate smoothly and that there is no load.

Note:

Be careful not to scratch the surface of the mechanical chassis when inserting the tweezer tips into the cam assembly ❶ hole.

3. Mounting

1) Refer to 3-21. and mount the LM motor assembly.
2) Refer to 3-24. and mount the drum unit.
3) Refer to 3-14. and mount the TG-4 base assembly and TG-5 base assembly.
4) Refer to 3-10. and mount the LS chassis assembly.
5) Refer to 1-1. and 1-2. and mount the cassette arm assembly and LS cassette compartment assembly.

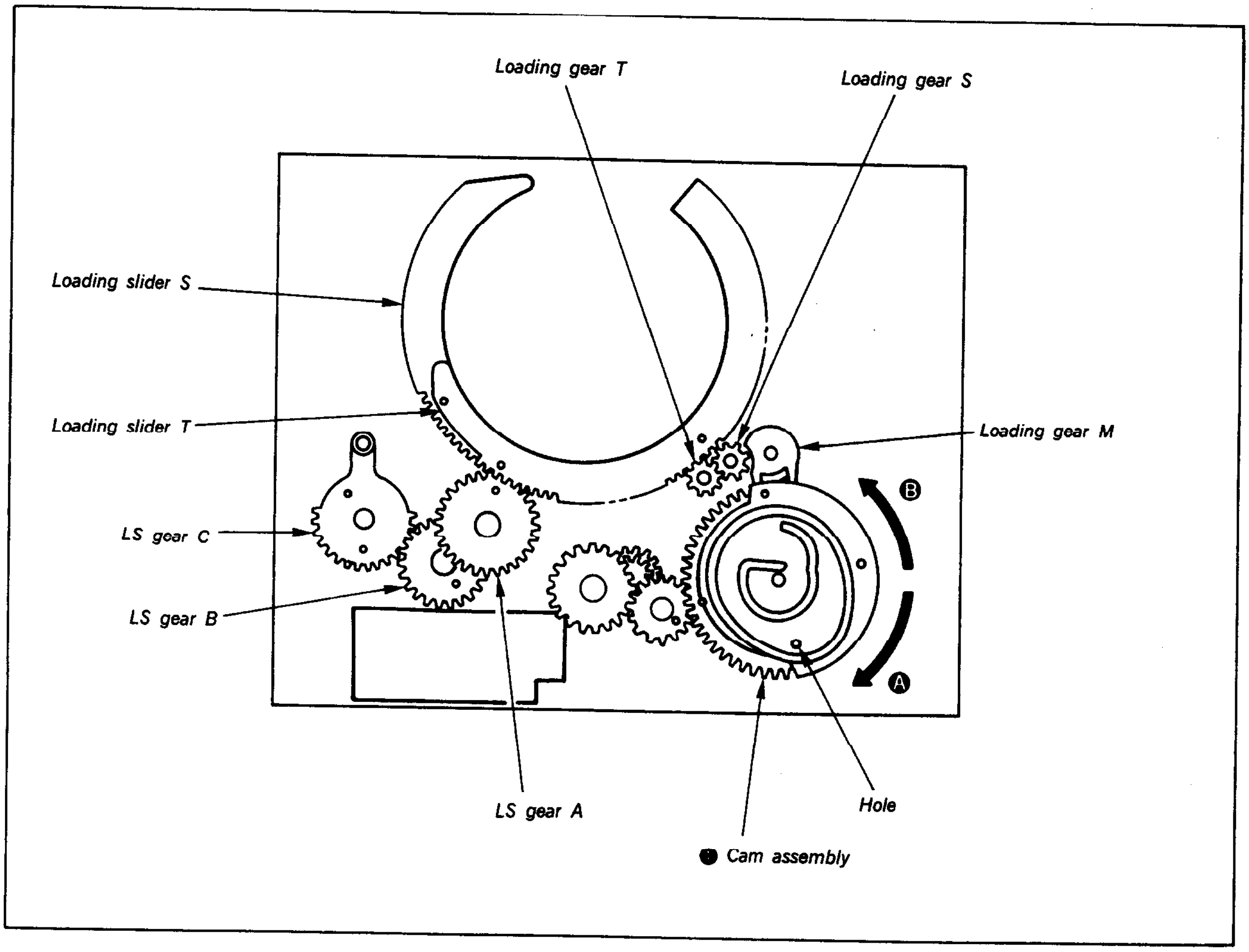

Loading gear T
Loading gear S
Loading slider S
Loading slider T
Loading gear M
Ⓑ
LS gear C
LS gear B
Ⓐ
LS gear A
Hole
❶ Cam assembly

Fig. 31.

3-19. Flexible Board (Fig. 32.)

1. Removal

1) Refer to 1-1. and 1-2. and remove the cassette arm assembly and LS cassette compartment assembly.
2) Refer to 3-10. and remove the LS chassis assembly.
3) Refer to 3-4. and remove the T reel table assembly.
4) Refer to 3-3. and remove the S reel table assembly.
5) Release the two claws ❶, lift up the push switch and peel flexible board ❷ off of the LS chassis.

   Note:

   When peeling off flexible board ❷, be careful not to tear it, and also be careful not to pull the LS chassis out of shape.

2. Mounting

1) Clean the portion of the LS chassis assembly where flexible board ❷ is to be attached with ethanol.
2) Remove the tape on the back of a new flexible board, line up to LS chassis shaft ❸ and claw ❹ and mount.
3) Line up the two dowels ❺, mount on claws ❶, and line up dowel ❻ to flexible board ❷ hole and mount.
4) Refer to 3-3. and mount the S reel table assembly.
5) Refer to 3-4. and mount the T reel table assembly.
6) Refer to 3-10. and mount the LS chassis assembly.
7) Refer to 1-1. and 1-2. and mount the cassette arm assembly and LS cassette compartment assembly.

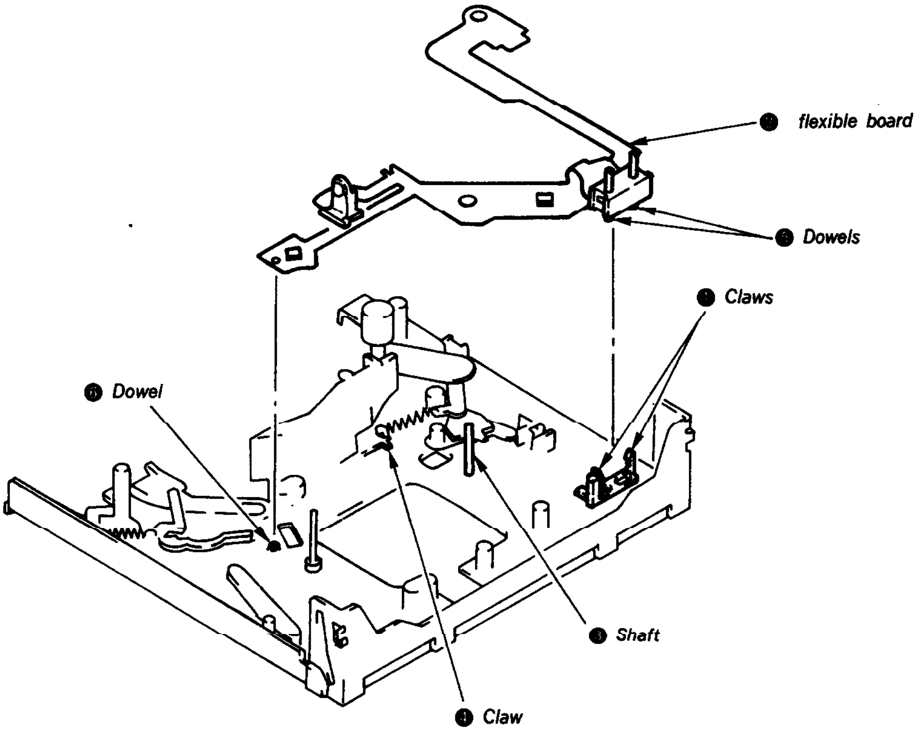


Fig. 32.

3-20. Cassette Compartment Lock Assembly (Fig. 33.)

1. Removal

1) Refer to 1-1. and 1-2. and remove the cassette arm assembly and LS cassette compartment assembly.
2) Refer to 3-10. and remove the LS chassis assembly.
3) Put into READY mode.
4) Remove screws ● and ● and remove cassette compartment lock assembly ●.
5) Remove screw ● and CCD SW ●.

2. Mounting

1) Mount CCD SW ● with screw ●.
2) Line up cassette compartment lock assembly ● to dowel ● and mount.
3) Tighten screws ● and ●.
4) Put into BLANK after GUIDE LOAD mode.
5) Refer to 3-10. and mount the LS chassis assembly.
6) Refer to 1-1. and 1-2. and mount the cassette arm assembly and LS cassette compartment assembly.

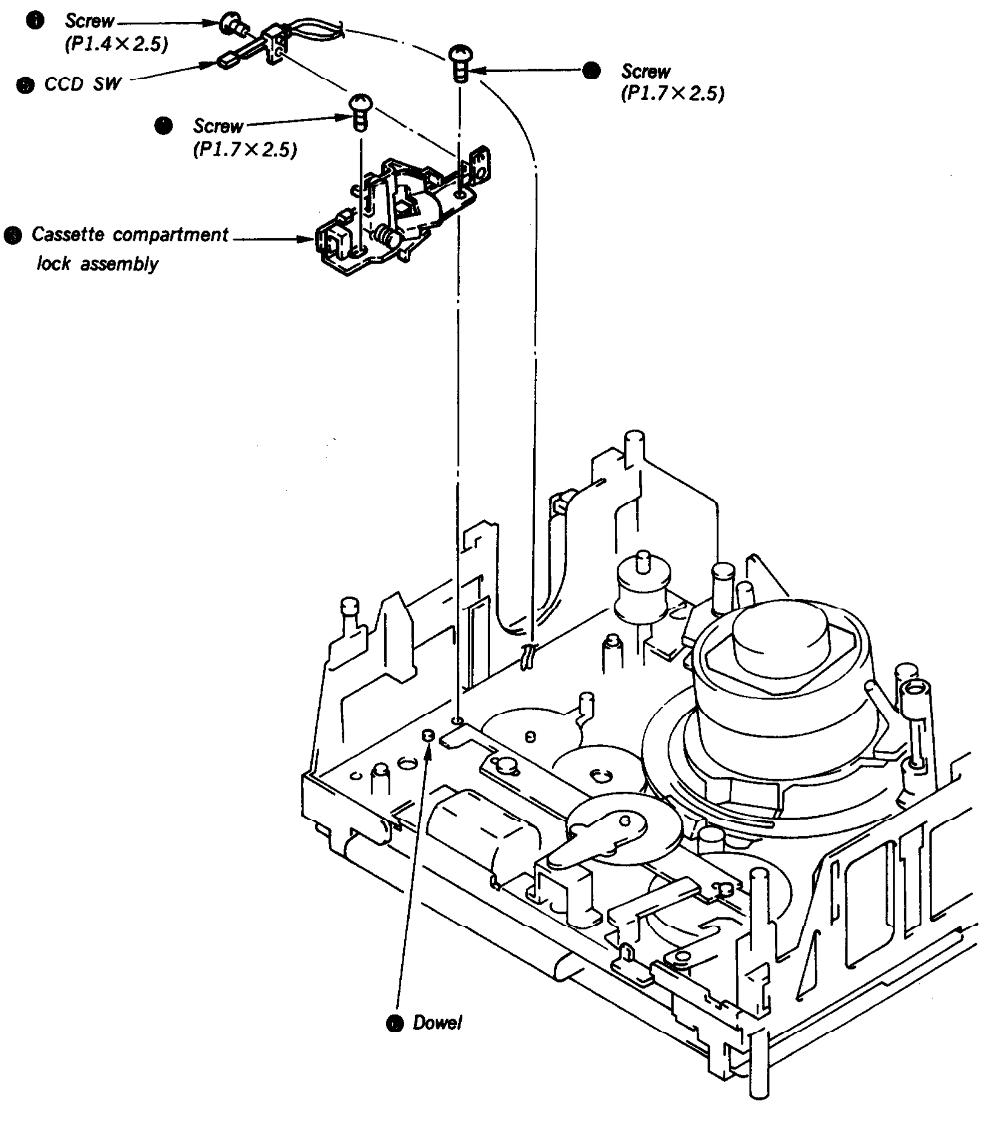

● Screw
(P1.4×2.5)
● CCD SW
● Screw
(P1.7×2.5)
● Screw
(P1.7×2.5)
● Cassette compartment lock assembly
● Dowel

Fig. 33.

3-21. LM Motor Assembly (Fig. 34.)

1. Removal

1) Open the PC board back of mechanism chassis with reference to the Service Manual.
2) Remove screws ❶, ❷ and ❸ and remove LM motor assembly ❹ in the direction of arrow Ⓐ.
3) Remove stopper washer ⓫ from shaft ❽ and remove worm wheel ❿.
4) Remove the two screws ❺ and separate motor holder assembly ❻ and DC motor ❼.
5) Unsolder the two cords ⓬ coming out of DC motor ❼ and remove the DC motor from the mechanical chassis.

2. Mounting

1) Apply ⅓ drop of oil to shaft ❽ and mount worm wheel❿.
2) Apply grease about the size of a grain of rice to worm ❾.
3) Assemble motor holder assembly ❻ and DC motor ❼.
4) Solder the two cords on DC motor ❼ in the two locations shown in Fig. A.
5) Line up mechanical chassis pin ⓭ and motor holder assembly ❻ hole, and mount.
6) Tighten screws ❸, ❷ and ❶ in that order.

   Note 1:

   Soldering should be done at 260 deg. C, within five seconds.

   Note 2:

   Pull out the cords on DC motor ❼ so that they are not slack on the chassis.

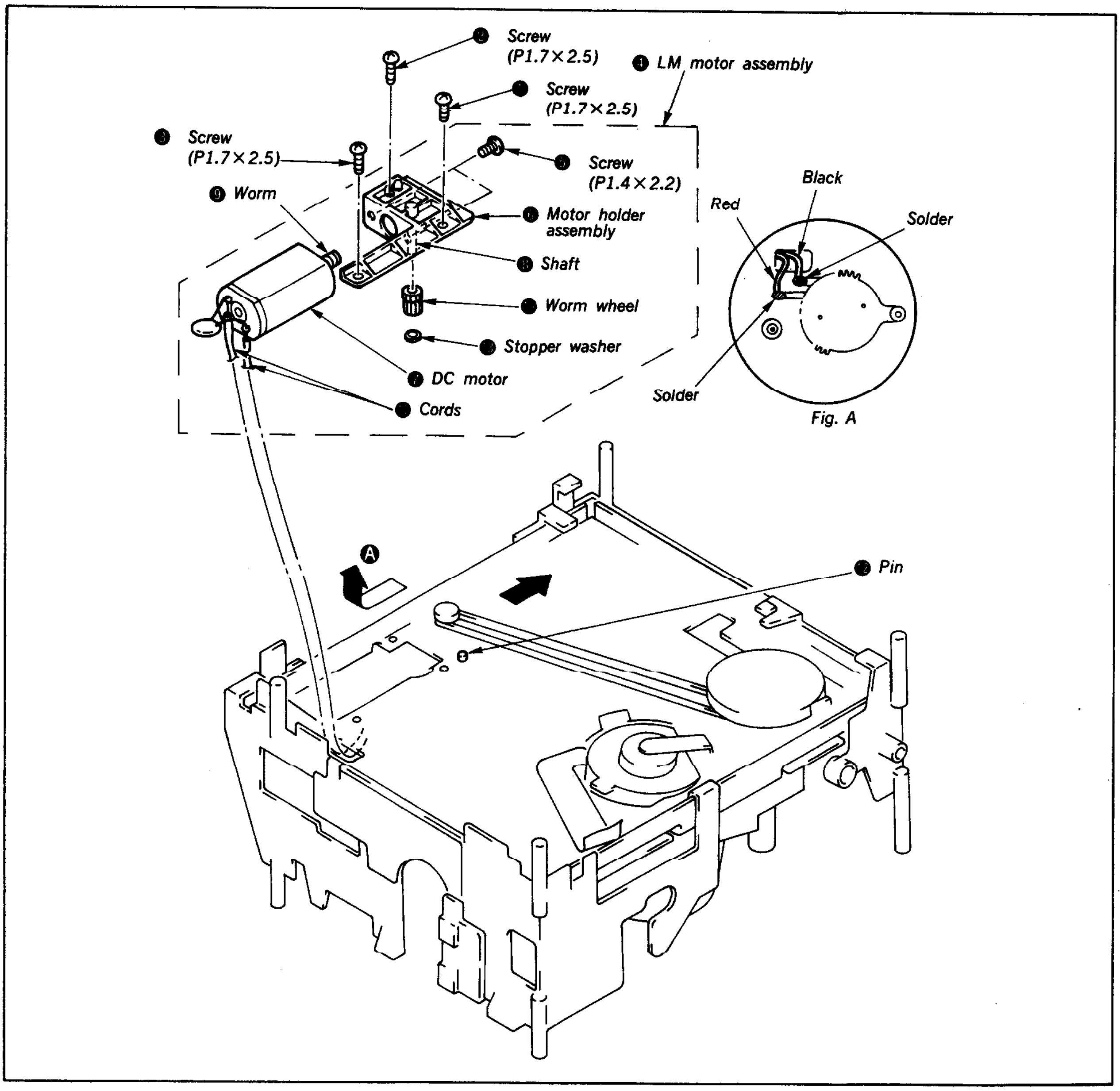

❷ Screw (P1.7×2.5)
❹ LM motor assembly
❶ Screw (P1.7×2.5)
❸ Screw (P1.7×2.5)
❺ Screw (P1.4×2.2)
❾ Worm
❻ Motor holder assembly
❽ Shaft
❿ Worm wheel
⓫ Stopper washer
❼ DC motor
⓬ Cords
Black
Red
Solder
Solder
Fig. A
Ⓐ
⓭ Pin

Fig. 34.

3-22. Capstan Motor Assembly (Fig. 35.)

1. Removal

1) Open the PC board back of mechanism chassis with reference to the Service Manual.
2) Remove screws ❶ and ❷ and capstan motor assembly ❺.
3) Remove stopper washer ❻ and conversion gear assembly ❼ and relay belt ❸.

Note:

Be careful not to touch the capstan motor shaft, oil seal and rotor, all marked ∗. When removing, hold the housing, marked ∗. (Do the same when mounting.)

2. Mounting

1) As shown in Fig. A, apply more than ⅓ but less than ½ drop of oil to the portion of shaft ❽ indicated by the arrow.
2) Place relay belt ❸ on conversion gear assembly ❼ and mount on shaft ❽.
3) Secure with stopper washer ❻.
4) Place pulley ❹ on relay belt ❸ and mount capstan motor assembly ❺ on the mechanical chassis.
5) As shown in Fig. B, confirm that the capstan motor and mechanical chassis surfaces are horizontal, then tighten screws ❶ and ❷ in that order.

Note 1:

Make sure that stopper washer ❻ is completely in the shaft groove.

Note 2:

Be careful not to stretch relay belt ❸.

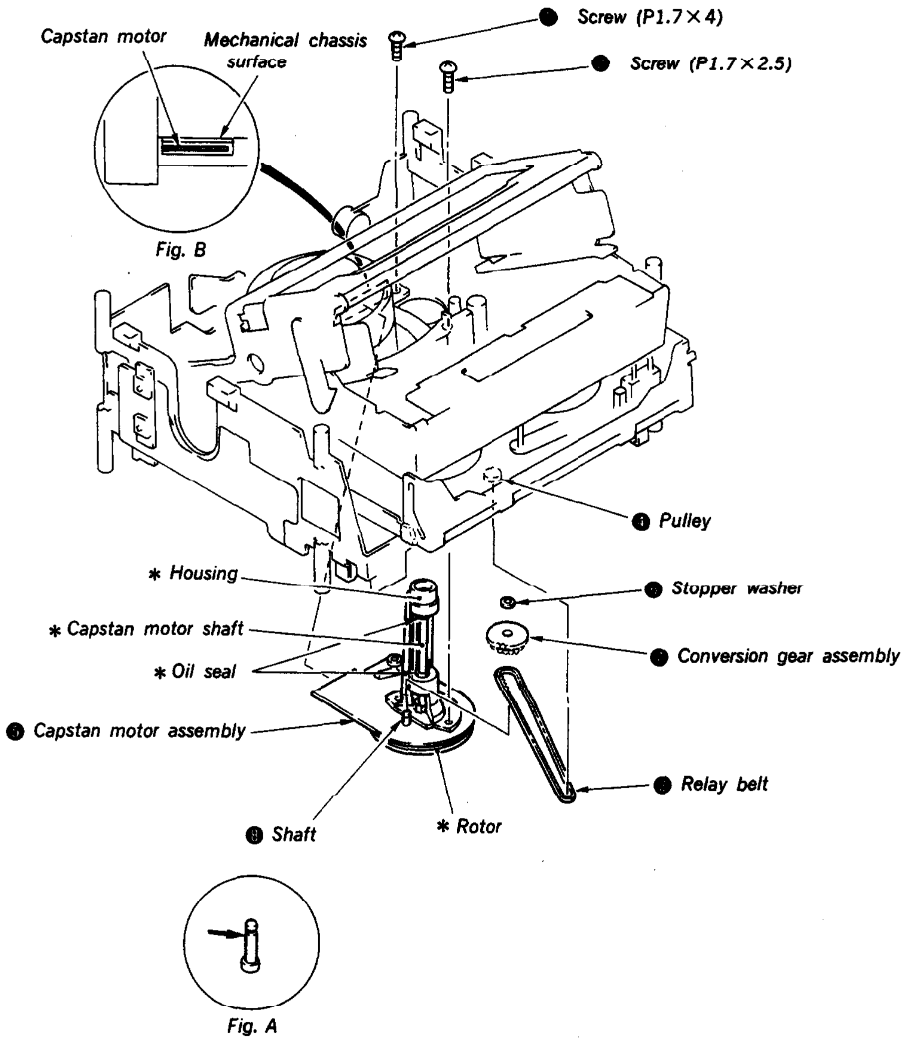

❶ Screw (P1.7×4)
❷ Screw (P1.7×2.5)
Capstan motor
Mechanical chassis surface
Fig. B
❹ Pulley
∗ Housing
❻ Stopper washer
∗ Capstan motor shaft
❼ Conversion gear assembly
∗ Oil seal
❺ Capstan motor assembly
❸ Relay belt
❽ Shaft
∗ Rotor
Fig. A

Fig. 35.

3-23. TG-2 (Fig. 36.)

1. Removal

1) Remove TG-2 nut ❶.
2) Remove upper flange bearing ❷, TG-2 flange ❸, TG-2 roller ❹, TG-2 sleeve ❺, TG-2 lower flange ❻, Lower flange bearing ❼ and pressure coil spring ❽.

Note 1:

When removing TG-2 nut ❶, be careful that other parts are not pushed off by pressure coil spring ❽.

Note 2:

Wear gloves when mounting and removing TG-2 flange ❸ and TG-2 roller ❹.

2. Mounting

1) Mount pressure coil spring ❽, Lower flange bearing ❼, TG-2 lower flange ❻, TG-2 sleeve ❺, TG-2 roller ❹, TG-2 flange ❸ and upper flange bearing ❷.
2) Mount TG-2 nut ❶.
3) Pre-set TG-2 height.

3. TG-2 Height Pre-set

1) Push upper flange bearing ❷ down as shown in Fig. A.
2) Screw in TG-2 nut ❶ until the slit is at the same height as TG-2 shaft ● upper surface.
3) As shown in Fig. B, rotate TG-2 nut ❶ 180 degrees in the direction of the arrow.

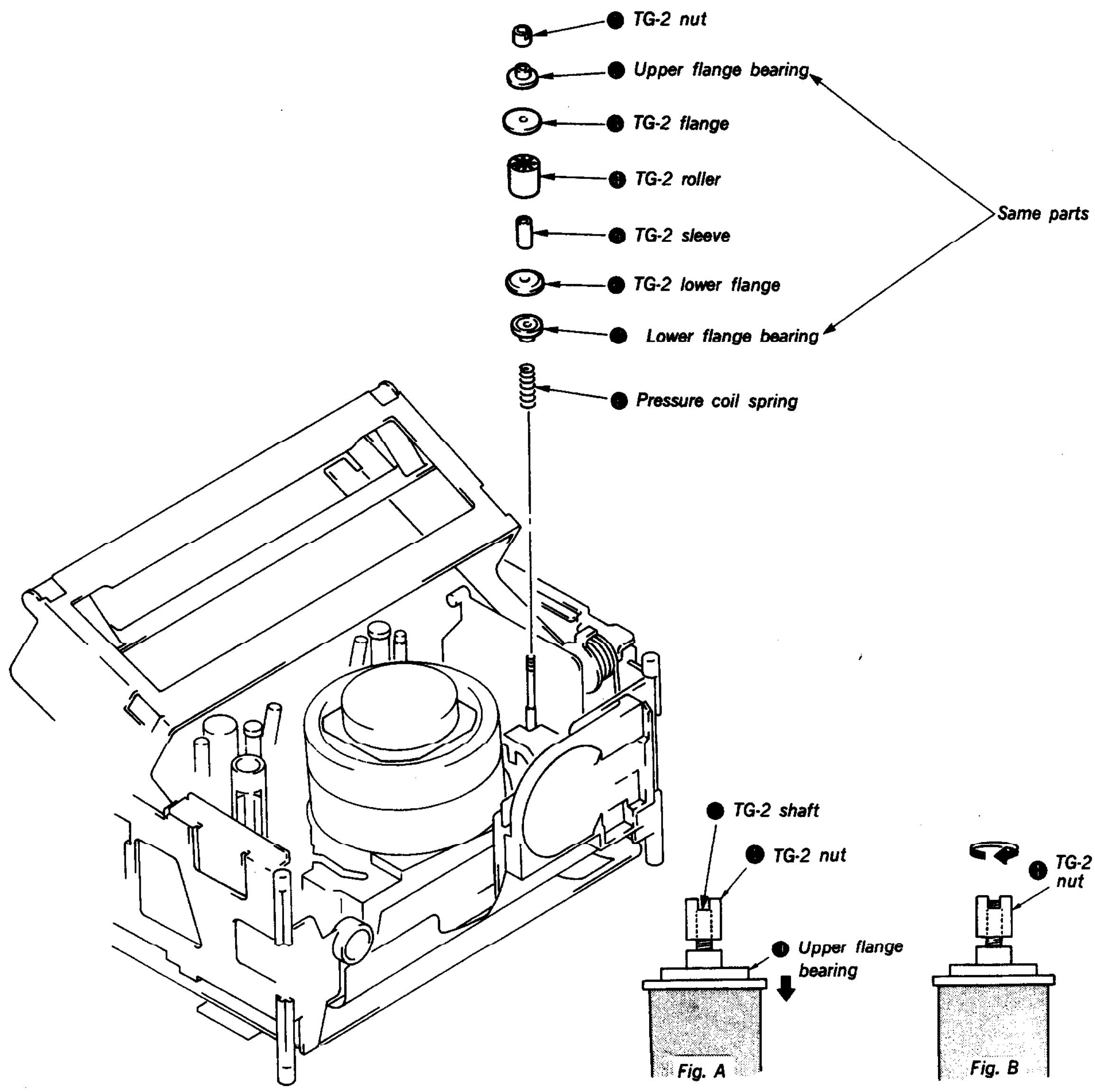

❶ TG-2 nut
❷ Upper flange bearing
❸ TG-2 flange
❹ TG-2 roller
❺ TG-2 sleeve
❻ TG-2 lower flange
❼ Lower flange bearing
Same parts
❽ Pressure coil spring
● TG-2 shaft
❶ TG-2 nut
❷ Upper flange bearing
Fig. A
❶ TG-2 nut
Fig. B

Fig. 36.

3-24. Drum Unit (Fig. 37.)

1. Removal

There are two types of Drum unit as follows.

ⓐ Connected to Drum unit with flexible board.

ⓑ Connected to Drum unit with harness. (Connector)

1) Set to EJECT mode.
2) Remove the flexible board or the connector, open the PC board back of mechanism chassis with reference to the Service Manual.
3) Remove the two screws ● and screw ●, and remove Drum base ● and Dew sensor ●.
4) Remove the three screws ● and Drum unit ●.

2. Mounting

1) Mount Drum unit ● on Drum base ● and secure with the three screws ●.
2) Place Drum base ● on the mechanical chassis and mount with the two screws ●.
3) Secure Dew sensor ● and Drum base ● with screw ●.

   Note:

   Once screws ● and ● are loosend, do not use the same screws again.
4) As shown in Fig. A, apply grease to the porition indicated by the arrows.
5) Mount a flexible board or a connector to the board.
6) Perform 4, Tape Path Adjustment.

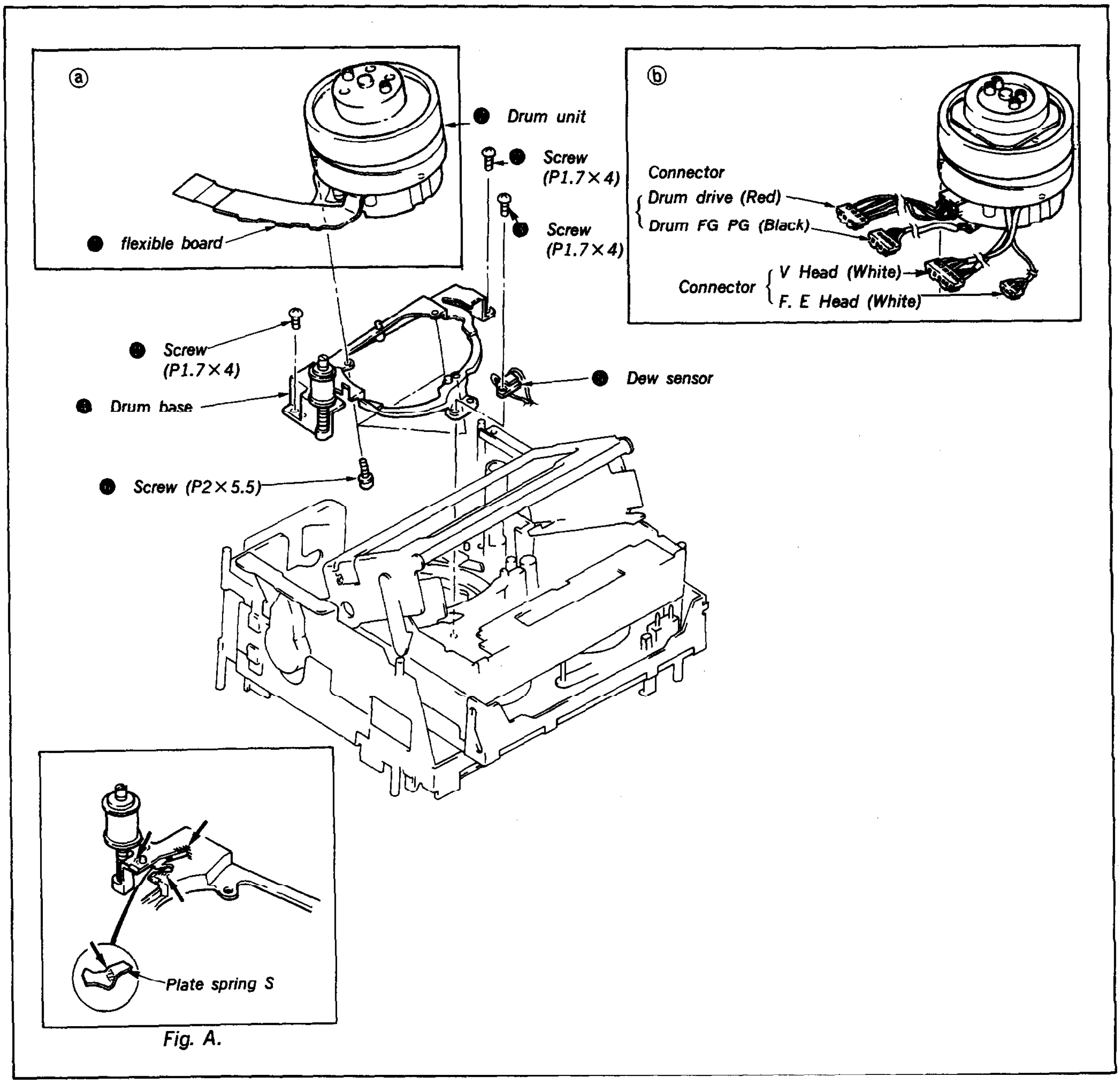

ⓐ
● flexible board
● Drum unit
● Screw (P1.7×4)
● Screw (P1.7×4)
ⓑ
Connector
Drum drive (Red)
Drum FG PG (Black)
Connector
V Head (White)
F. E Head (White)
● Screw (P1.7×4)
● Drum base
● Dew sensor
● Screw (P2×5.5)
Plate spring S

Fig. A.

Fig. 37.

3-25. Rotary Upper Drum Replacement

1. Removal

- If recording is possible, record first before removing.
- In case of the one with a Damper, remove the Damper by taking off two hexagonal socket bolts.

1) Remove the six solders indicated by ⓐ and confirm that the board and the pins on the bottom move freely, using tweezers or the like.
2) Remove the two hexagonal socket bolts ●. (Fig. 38.)
3) Mount jig ● (Ref. No. J-10) in the screw hole with the two screws ●, which are supplied. Then when the hexagonal socket bolt ● is screwed into the jig, the Rotary upper Drum will rise and can be removed. (Fig. 39.)

2. Mounting

1) Clean the flange surface and the surface of the Rotary upper Drum ● which comes into contact with it, and make sure there are no scratches or dirt.
2) Insert jig ● (Ref. No. J-10) into the Drum positioning hole, through the Rotary upper Drum ● positioning hole, and set the Rotary upper Drum.
   Note:
   Confirm that pin ● can be seen through Rotary upper Drum board hole at this time. (Fig. 40.)
3) Remove jig ● and lightly press Rotary upper Drum ● by hand. However, when it does not go all the way in, tighten hexagonal socket bolts ● alternately.
4) Insert jig ● into positioning hole ● again and make sure it goes in smoothly. If not, loosen the two hexagonal socket bolts ● and set again following step 3) under Removal.
5) Tighten the two hexagonal socket bolts ●.
6) Solder pins ●.
   Note:
   Be sure that solder does not go under the board.

- In case of the one with a Damper. Mount the damper with the two hexagonal socket bolts.
  Note:
  After mounting, perform 4. Tape Path Adjustment.

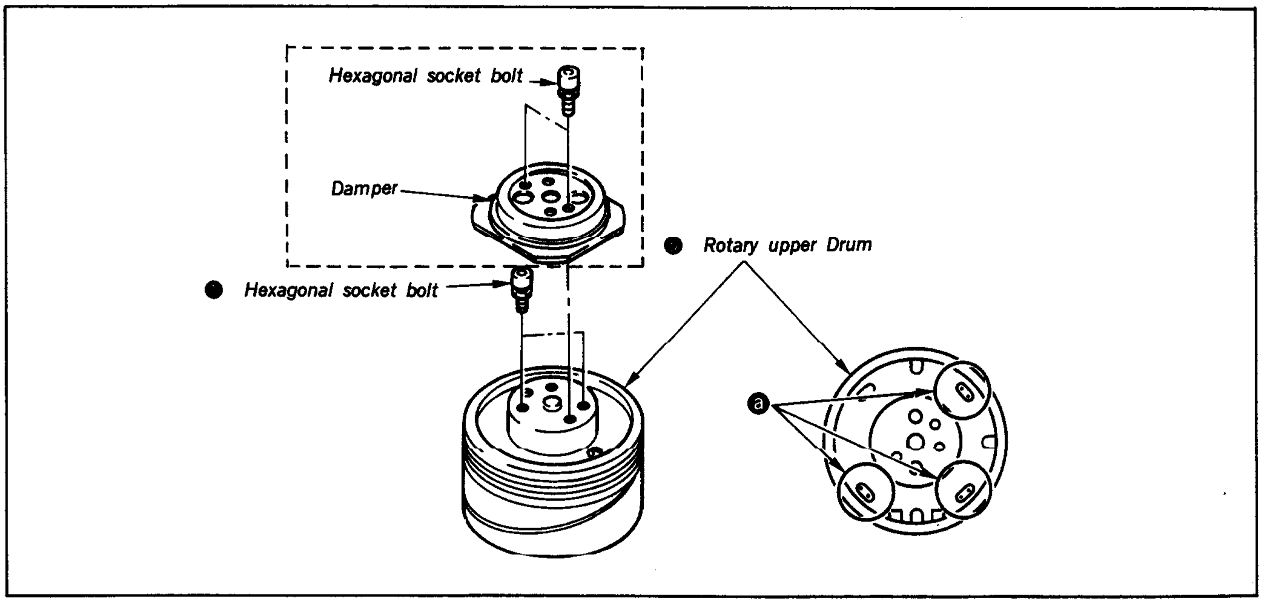


Fig. 38.

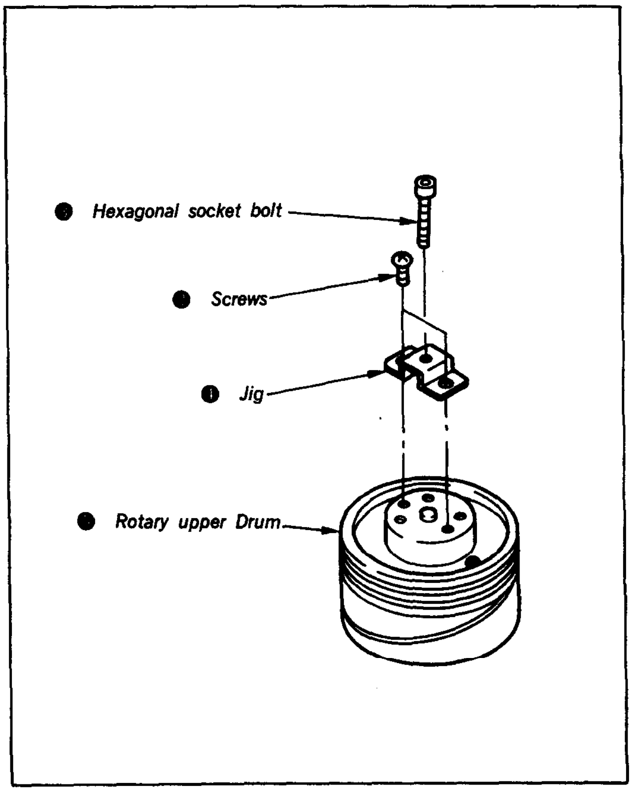

Hexagonal socket bolt
Screws
Jig
Rotary upper Drum

Fig. 39.

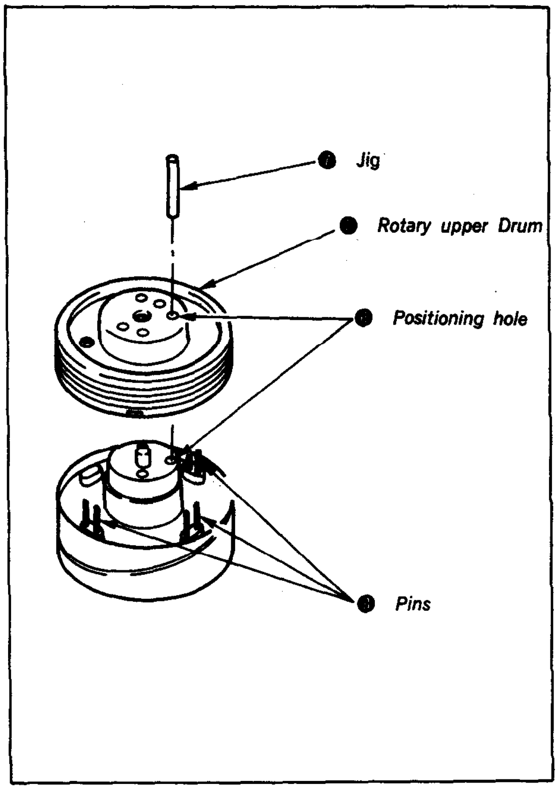

Jig
Rotary upper Drum
Positioning hole
Pins

Fig. 40.

3-26. Reel Table Height Check (Fig. 41.)

1. Removal

1) Refer to 1-1. and 1-2. and remove the cassette arm assembly and LS cassette compartment assembly.
2) Refer to 3-1. and remove the reel lock lever assembly.
3) Refer to 3-2. and remove the pendulum stopper plate.

2. Check

1) Confirm that the distances between the LS chassis ❶ and S reel table reel bearing surface ❷ and T reel table reel bearing surface ❸ respectively are 6.85 ±0.15mm, using calipers, etc.

3. Mounting

1) Refer to 3-2. and mount the pendulum stopper plate.
2) Refer to 3-1. and mount the reel lock lever assembly.
3) Refer to 1-1. and 1-2. and mount the cassette arm assembly and LS cassette compartment assembly.

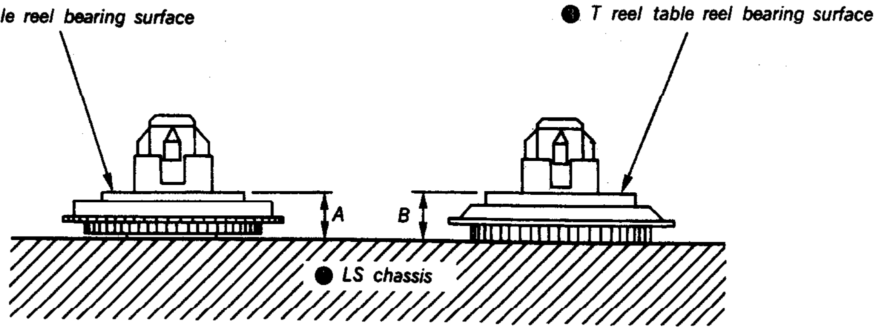

❷ S reel table reel bearing surface
❸ T reel table reel bearing surface
A
B
❶ LS chassis

Fig. 41.

3-27. FWD/RVS Torque Check

1) Set the FWD, RVS winding torque cassette (Ref. No. J-9).
2) In FWD mode, confirm that T reel torque value is 11g/cm — 19g/cm.
3) Turn REC/REVIEW button on and check that S reel torque value is 20g/cm — 32g/cm.
4) If the above values are not satisfied, replace the relative reel table.

3-28. Tension Regulator Position Adjustment

1. Removal

1) Refer to 1-1. and 1-2. and remove the cassette arm assembly and LS cassette compartment assembly.

2. Adjustment

1) Set a cassette tape, put into REC mode and run the tape. (Refer to 1-4.)
2) With the tape running, confirm that the portion of TG-1 arm assembly ❶ indicated by arrow Ⓐ is within ⅓ of the guide ❷ thickness (the portion indicated by arrow Ⓑ). (Fig. 42.)
3) If the position is not correct, remove the cassette and perform the adjustment starting with the next step 4).
4) Loosen screw ❸.
5) When TG-1 arm assembly ❶ is further inside than the prescribed position, move tension regulator band plate ❹ slightly in the direction of arrow Ⓒ, and when it is further outside, in the direction of arrow Ⓓ, and secure with screw ❸. (Fig. 43.)

Note 1:

The cassette tape should be run at the middle section.

Note 2:

When performing steps 4) and 5), remove the cassette tape first.

3. Mounting

1) Refer to 1-1. and 1-2. and mount the cassette arm assembly and LS cassette compartment assembly.

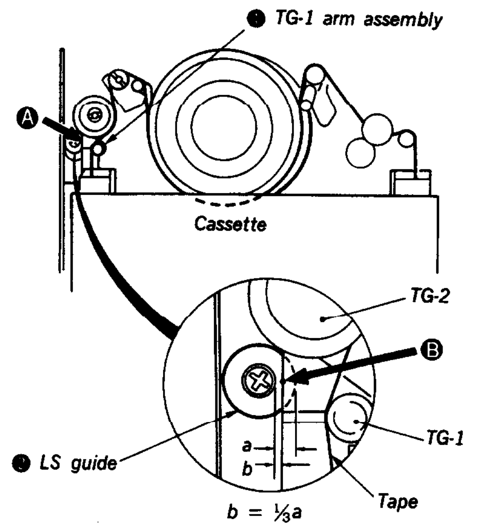


Fig. 42.

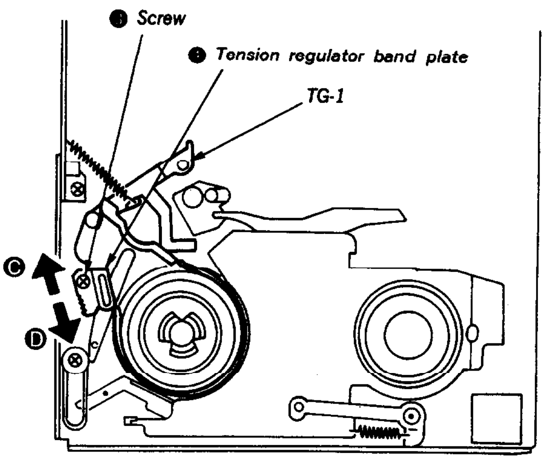


Fig. 43.

3-29. FWD Back Tension Adjustment

1. Removal

1) Refer to 1-1. and 1-2. and remove the cassette arm assembly and LS cassette compartment assembly.

2. Adjustment

1) Put into REC mode.
2) Set the tension measurement reel (Ref. No. J-7) ❶.
3) Use the dial tension gauge (Ref. No. J-6) ❷ and measure exit side tape tension. At this time, pull the tape at 14mm/sec to measure. (Fig. 45.)
4) Change the position of the tension regulator spring ❸ position ❹ so that the tension is 6.9 — 7.9g. (Fig. 44, 45)

3. Mounting

1) Refer to 1-1. and 1-2. and mount the cassette arm assembly and LS cassette compartment assembly.

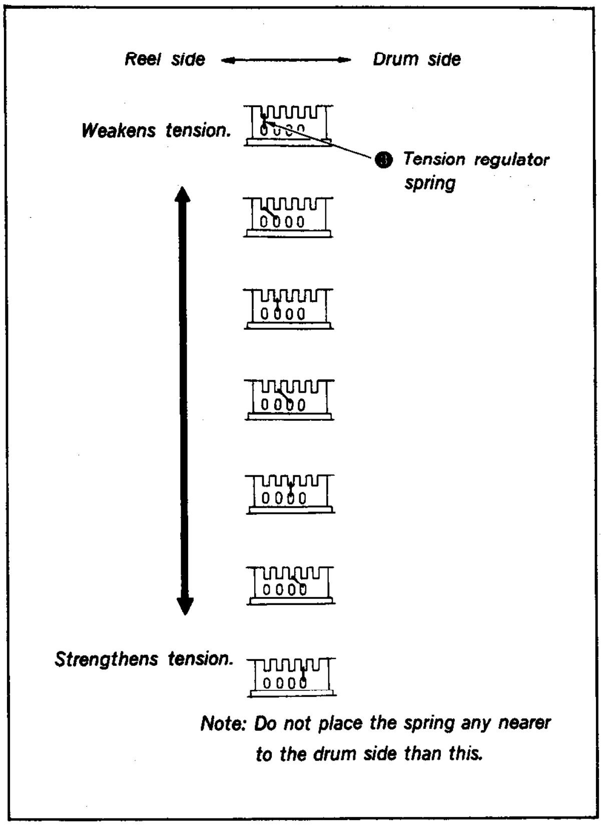

Reel side ←→ Drum side
Weakens tension.
❸ Tension regulator spring
Strengthens tension.
Note: Do not place the spring any nearer to the drum side than this.

Fig. 44.

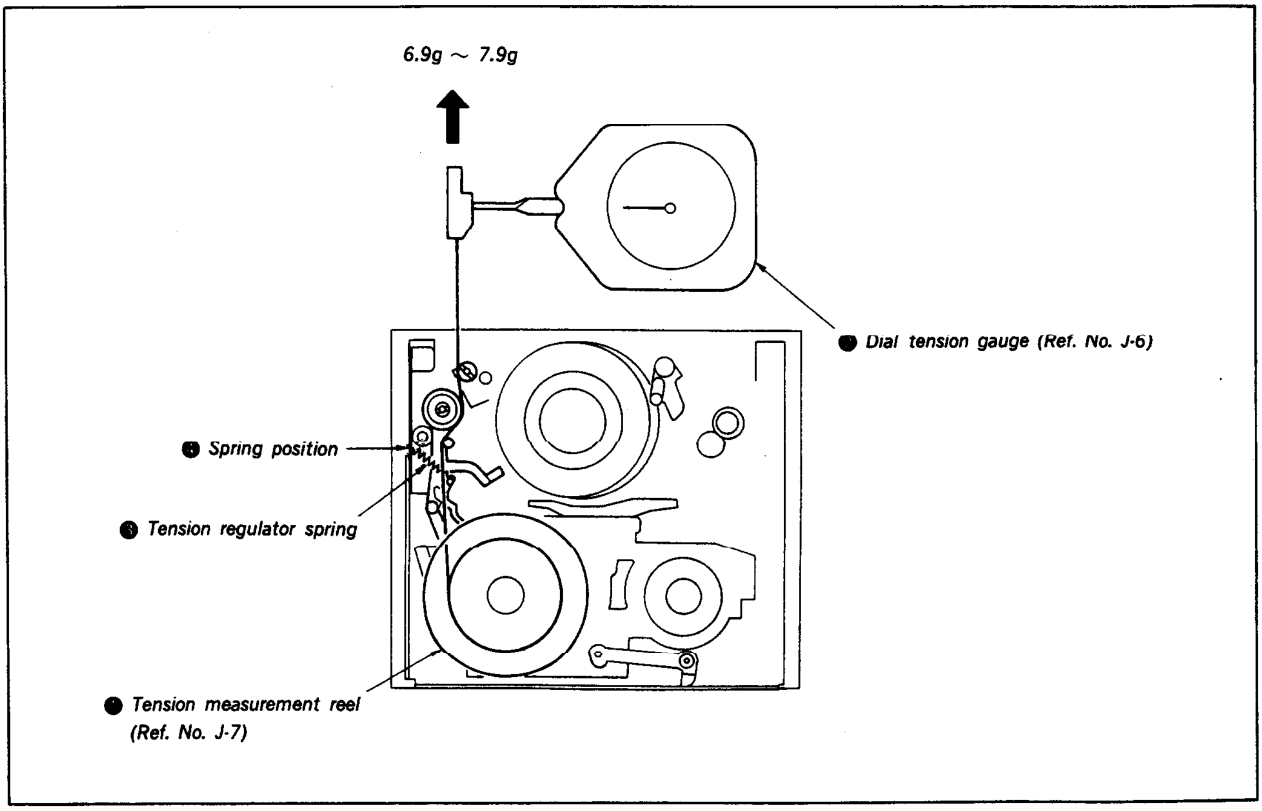

6.9g ~ 7.9g
❷ Dial tension gauge (Ref. No. J-6)
❹ Spring position
❸ Tension regulator spring
❶ Tension measurement reel (Ref. No. J-7)

Fig. 45.

3-30. TS Gear Assembly (Fig. 46.)

1. Removal

1) Refer to 1-1. and 1-2. and remove the cassette arm assembly and LS cassette compartment assembly.
2) Refer to 3-1. and remove the reel lock lever assembly.
3) Refer to 3-2. and remove the pendulum stopper plate.
4) Refer to 3-4. and remove the T reel table assembly.
5) Remove TS gear assembly ❶.

2. Mounting

1) Mount TS gear assembly ❶ on shaft ❷.
2) Refer to 3-4. and mount T reel table assembly.
3) Refer to 3-2. and mount the pendulum stopper plate.
4) Refer to 3-1. and mount the reel lock lever assembly.
5) Refer to 1-1. and 1-2. and mount the cassette arm assembly and LS cassette compartment assembly.

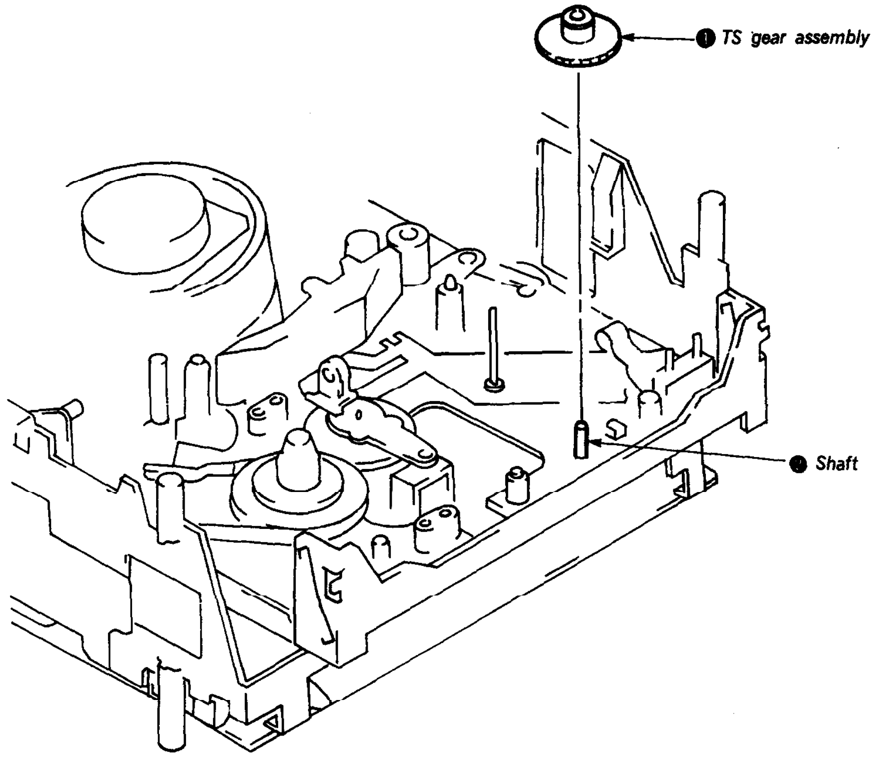


Fig. 46.

4. TAPE PATH ADJUSTMENT

(Track Shift Jig)

Four types of pilot signals are used to control tape running speed on 8mm video systems, and ATF (Automatic Track Finding) is used for high precision tracking. This does away with the need for a tracking adjustment knob and allows accurate track tracing.
However, some aspects of the ATF system create a problem in adjusting the tape path system. Correction is automatic if the head tracing is a little off, which means that perfect tape path adjustment can not be done.
Therefore, the track shift jig (Ref. No. J-16: J-6080-891-A) is used for tape path adjustment. The track shift jig forces ATF to be released, and the tracking amount can be set (track shift) manually, so that tape path adjustment can be performed easily.

* Track shift & Monitor Jig (NTSC : J-6080-843-A, PAL : J-6080-851-A) is useful instead of track shift Jig.

- **Confirm that Camera Adjustment and Video Adjustment have been complete before performing this adjustment.**

4-1. Track Shift Jig Connection

Note:
- Refer to the Track Shift Jig instruction manual for details.
- As there are individual connection cords for each model, confirm each time with Service Manual.

1. Connectors

RF/SWP ················Pin for extraction of RF SW PULSE and Drum head CH1 and CH2 RF signal

CTL ····················Pin which supplies SEL, ATF LOCK, etc. signals

There are two ways of connection method to the unit.
One is to use a connector (Ref No. J-17) between the terminal of RF/SWP and CTL.
The other is to use two connectors for each terminal.

2. Switch Setting

SEL ····················"ON" when performing track shift.
When "OFF", control is from the connected set.

PATTERN ··············Set to EV side.

ATF LOCK ··············Set to "OFF".

Exa.(1)

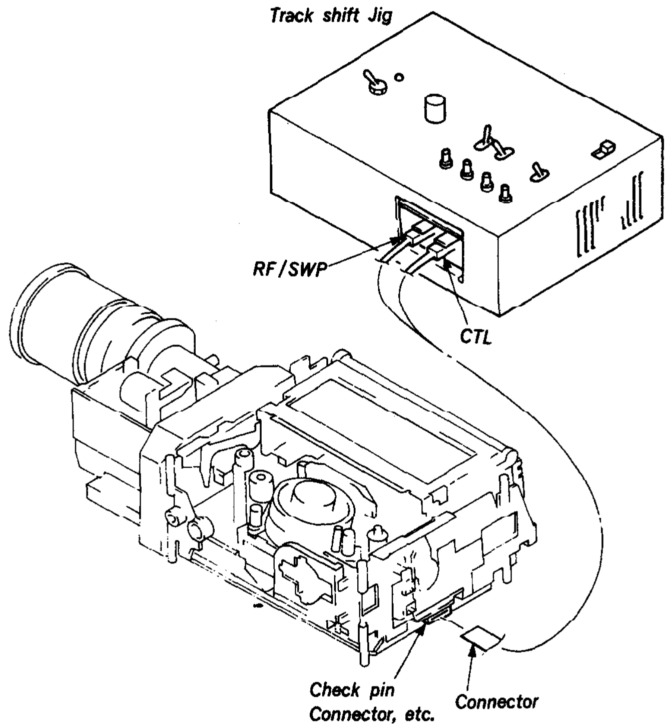


Fig. 47-1.

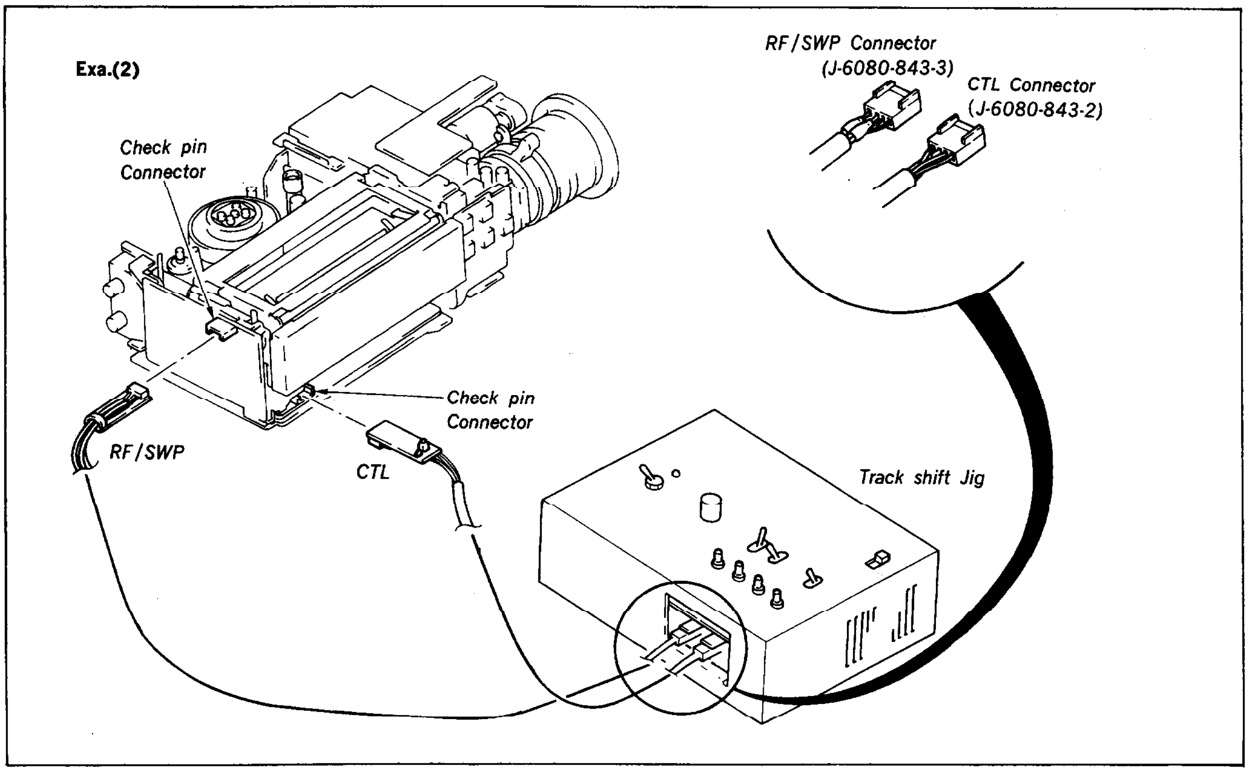

Exa.(2)
RF/SWP Connector
(J-6080-843-3)
CTL Connector
(J-6080-843-2)
Check pin
Connector
Check pin
Connector
RF/SWP
CTL
Track shift Jig

Fig. 47-2.

4-2. Preparation for Adjustment

1) Clean the tape running surfaces (Tape guides, Drum, Capstan shaft, Pinch roller).
2) Refer to the track shift Jig connection diagram 4-1.), connect the track shift Jig and set the switches.
3) Oscilloscope connection:
   CH1: Track shift Jig CH2 pin
   (CH2 head output)
   CH2: Track shift Jig RF SWP pin
   (External trigger)
4) Play back a tracking alignment tape (NTSC-WR5-1N, PAL-WR5-1C).
5) Turn the track shift Jig track shift knob and adjust so that RF waveform amplitude is maximum. (Fig. 48.)
   When the RF waveform is unstable and difficult to adjust, adjust after turning ATF LOCK switch "ON". Switch to "OFF" after adjusting.

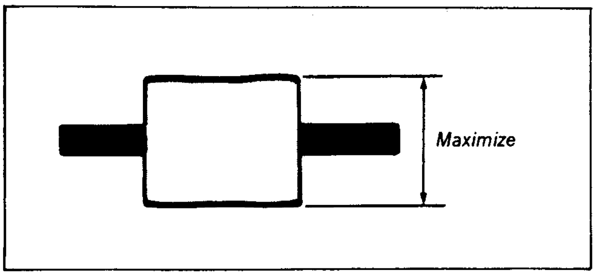


Fig. 48.

6) Confirm that the RF waveform is flat at both entrance and exit sides on the oscilloscope. (Fig. 49 ⓐ)
   If not, perform the following adjustment.
   When entrance/exit side RF waveform is not flat: (Fig. 49 ⓑ ⓒ)
   --- After performing 4-3. Tracking Coarse Adjustment, adjust according to 4-4. Tracking Fine Adjustment.

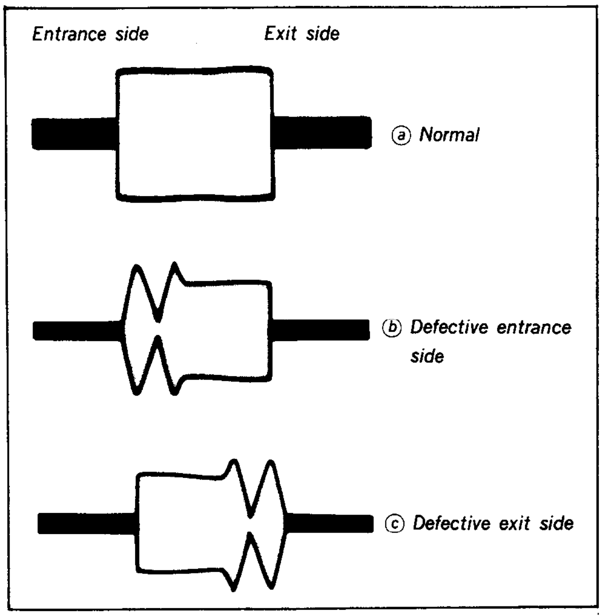

Entrance side
Exit side
ⓐ Normal
ⓑ Defective entrance side
ⓒ Defective exit side

Fig. 49.

7) When the RF waveform is OK, perform 4-6. Check after Adjustment.

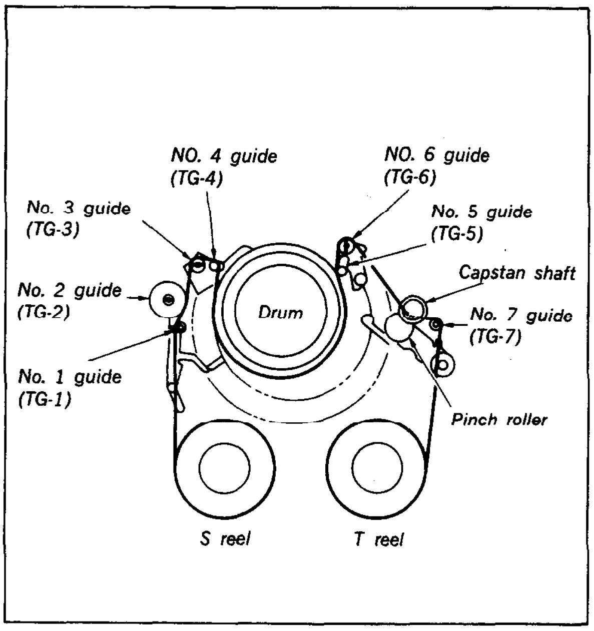

NO. 4 guide
(TG-4)
NO. 6 guide
(TG-6)
No. 3 guide
(TG-3)
No. 5 guide
(TG-5)
Capstan shaft
No. 2 guide
(TG-2)
Drum
No. 7 guide
(TG-7)
No. 1 guide
(TG-1)
Pinch roller
S reel
T reel

Fig. 50.

4-3. Tracking Coarse Adjustment

1) Play back a tracking alignment tape
2) Turn the track shift Jig track shift knob so that RF waveform amplitude is maximum. (Fig. 48.)
3) Loosen No. 3 guide (TG-3) lock screw ❶ and turn No. 3 guide so that the entrance side waveform is flat. (Fig. 51)
4) Loosen No. 6 guide (TG-6) lock screw ❷ and turn No. 6 guide so that the exit side waveform is flat. (Fig. 52)
   Note:
   Do not loosen the lock screws too much or the guide will move by themselves.

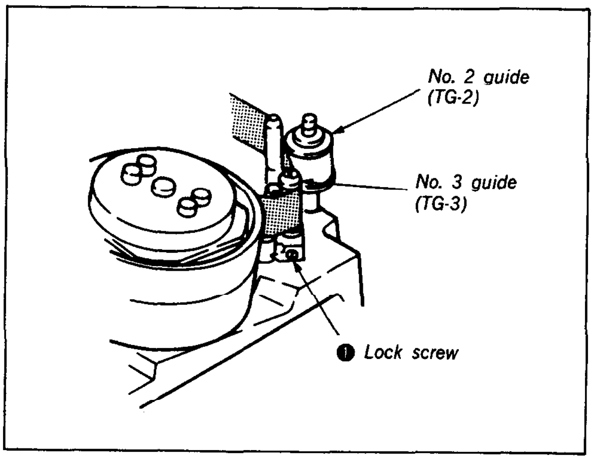

No. 2 guide
(TG-2)
No. 3 guide
(TG-3)
❶ Lock screw

Fig. 51.

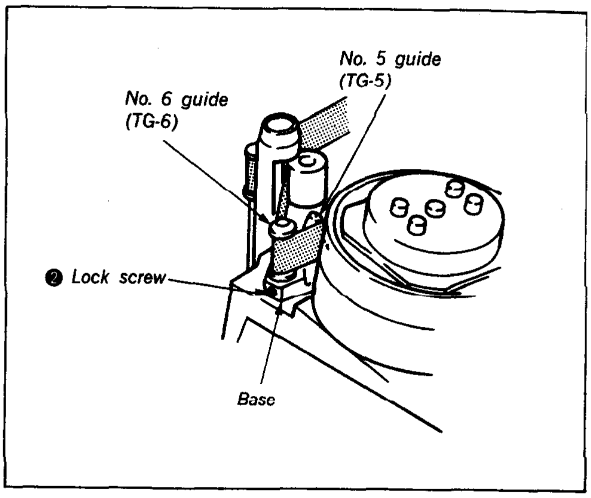

No. 5 guide
(TG-5)
No. 6 guide
(TG-6)
❷ Lock screw
Base

Fig. 52.

4-4. Tracking Fine Adjustment

1) Play back a tracking alignment tape, turn the track shif jig track shift knob counterclockwise and make the RF waveform amplitude ⅔ of maximum. (Fig. 53.)

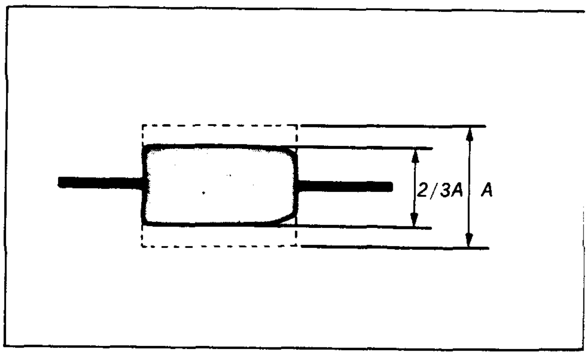


Fig. 53.

2) Confirm that the waveform is flat. If it is not, turn No. 3 (TG-3) and No. 6 (TG-6) guides to flatten it. (Fig. 51,52.)
3) Tighten No. 3 guide lock screw and lock No. 3 guide. At this time, confirm that the entrance side waveform does not change.
4) Tighten No. 6 guide lock screw and lock No. 6 guide. At this time, confirm that the exit side waveform does not change.
   Note:
   When tightening No. 6 guide lock screw, hold the base down lightly so that No. 5 guide (TG-5) tip does not touch the drum. (Fig. 52.)

4-5. No. 2 Guide (TG-2) Adjustment

When No. 2 guide has been rotated or replaced, pre-set height first and then perform adjustment.

1. No. 2 Guide Height Pre-set

1) Screw in TG-2 nut until the slit is the same height as the upper surface of TG-2 shaft. (Fig. 54 ⓐ)
   Note:
   Be sure to remove the screw lock completely first.
2) Rotate TG-2 nut 180 degrees clockwise. (Fig. 54 ⓑ)

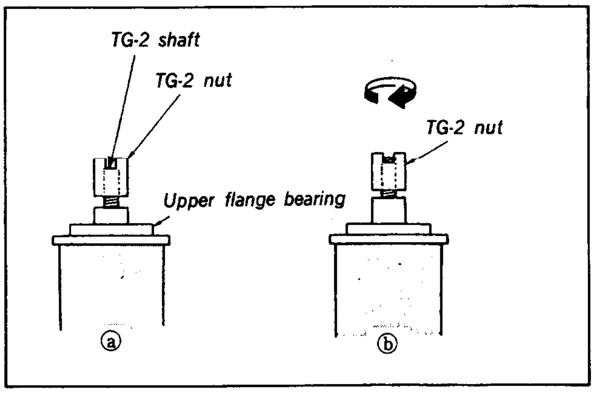


Fig. 54.

2. No. 2 Guide (TG-2) Adjustment

1) Play back a tracking alignment tape.
2) Turn track shift Jig SEL switch off.
3) Check the waveform in REV mode. (Fig. 55.)
   Note:
   Use the beginning (TAPE TOP) of the alignment tape to check.
   If the waveform is not correct, pre-set No. 2 guide height and perform the following adjustment. (Fig. 55 ⓐ)

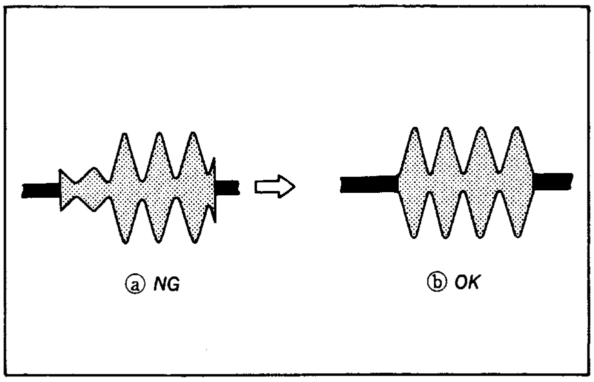


Fig. 55.

4) Rotate TG-2 nut 90 degrees clockwise and perform step 3) again. Repeat steps 3) and 4) until the correct waveform is obtained.
   At this time confirm that the tracking waveform has not changed. If it has, perform entrance side tracking fine adjustment and repeat step 3) again.
5) Tighten No. 3 guide (TG-3) lock screw. At this time confirm that the entrance side waveform does not change.
6) Apply screw lock to No. 2 guide (TG-2).

4-6. No.7 Guide (TG-7) Adjustment

1) Play back a tracking alignment tape and put into REV mode.
2) Confirm that there is no tape bending between No. 6 guide (TG-6) and the capstan. (Fig. 56) If there is, turn No. 7 guide (TG-7) until the bending disappears.
3) Put into playback again and confirm that there is no ending between No. 7 guide (TG-7) and the capstan.
   Specification: less than 0.5mm
   If there is bending, turn No. 7 guide (TG-7) until it disappears.

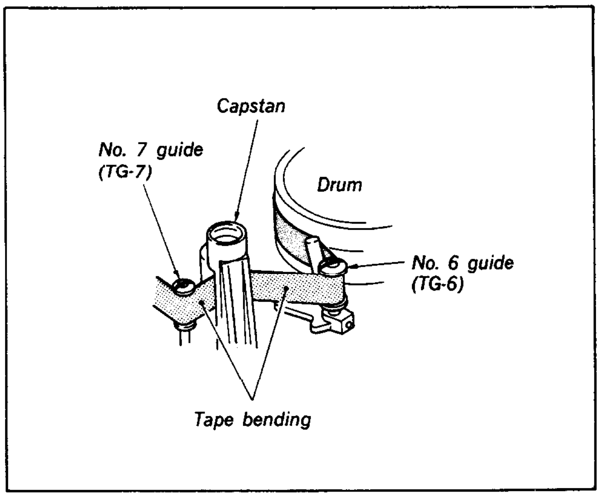


Fig. 56.

4-7. CUE, REV Waveform Check

1) Play back a tracking alignment tape and put into REV mode.
   The pitch of the waveform peaks should be uniform at this time. (Fig. 57 ⓐ)
   If not, perform 4-4. Tracking Fine Adjustment and 4-5. No. 2 Guide Adjustment.
2) Put into CUE mode. The waveform peak pitch should be uniform. (Fig. 57 ⓑ)
   If not, perform 4-4. Tracking Fine Adjustment.

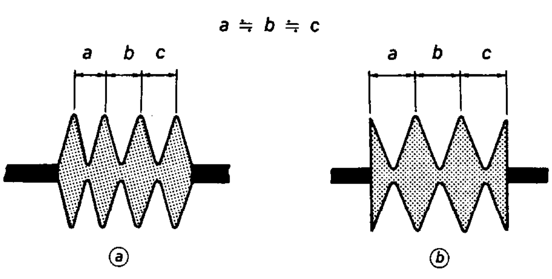


Fig. 57.

4-8. Check after Adjustment

1. Tracking Check

1) Play back a tracking alignment tape, turn the track s Jig track shift knob and adjust RF waveform amplit to ⅔ of maximum. (Fig. 58.)
2) At this time, confirm that the amplitude minimum va (E_{MIN}) is more than 75% of maximum value (E_{MAX}). (59.)
3) Confirm that there are no large fluctuations in waveform. (Fig. 60.)

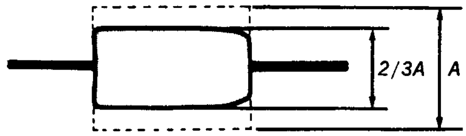
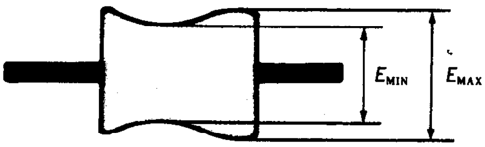
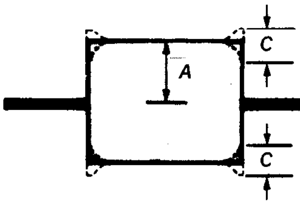


Fig. 58.



$$\frac{E_{MIN}}{E_{MAX}} \geqq 75\ (\%)$$

Fig. 59.



$C \leqq 1/8A$

Fig. 60.

2. Rise Check

1) Play back a tracking alignment tape.
2) Turn track shift Jig track shift knob so that RF waveform amplitude is maximum.
3) Eject, then load again.
4) In playback mode, confirm that the RF waveform rises to horizontal within 1 second. Also, confirm that there is no tape bending near the pinch roller at this time. (Fig. 61.)
5) Play back after CUE/REV and FF/REW, and confirm that the RF waveform rises to horizontal within 1 second. Also, confirm that there is no tape bending near the pinch roller at this time.
6) Repeat the checks in steps 3) — 5).

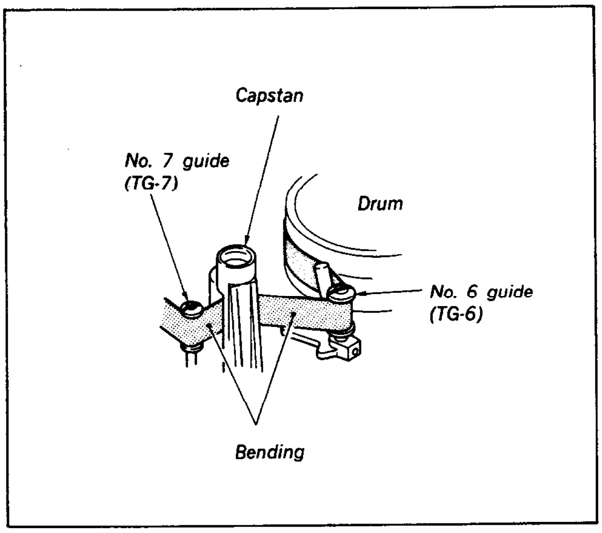

Capstan
No. 7 guide
(TG-7)
Drum
No. 6 guide
(TG-6)
Bending

Fig. 61.

3. Tape Running Check

In playback mode, make sure there are no spaces or large curls at No.2 guide lower flange, No. 3 guide upper flange and No.6 guide upper flange, and that there is no curl at No. 7 guide upper and lower flanges. (Fig. 62.)

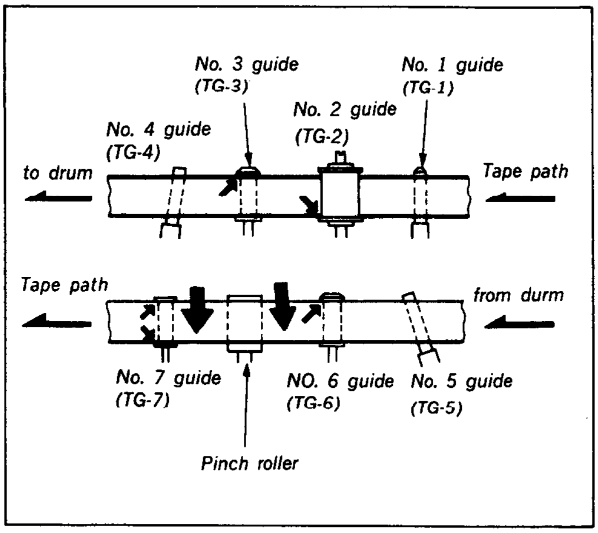

No. 3 guide
(TG-3)
No. 1 guide
(TG-1)
No. 2 guide
(TG-2)
No. 4 guide
(TG-4)
to drum
Tape path
Tape path
from durm
No. 7 guide
(TG-7)
NO. 6 guide
(TG-6)
No. 5 guide
(TG-5)
Pinch roller

Fig. 62.

8mm Video MECHANICAL ADJUSTMENT MANUAL

SONY.

SERVICE MANUAL

TYPEIII(O'MECHANISM)

SUPPLEMENT-1

This supplement updatas the 8mm Video MECHANICAL ADJUSTMENT MANUAL.
Please add or modify the following items.

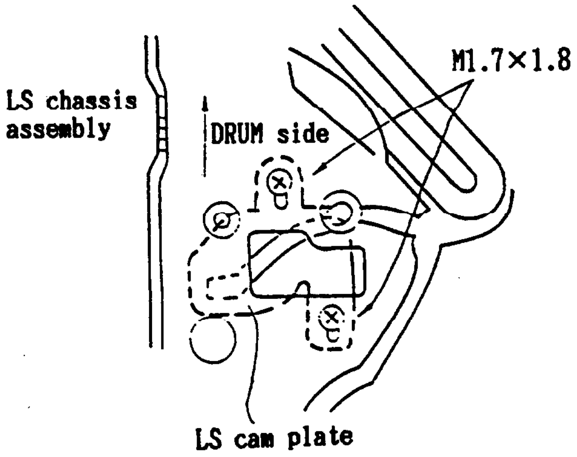
Please add the next item between 3-28. Tension Regulator Position Adjustment and 3-29. FWD Back Tension Adjustment.

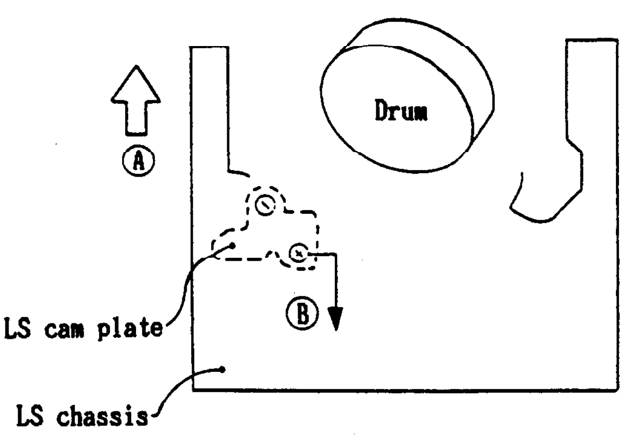
LS CAM PLATE ADJUSTMENT

LS cam plate must be adjusted, when replacing LS chassis assembly, LS cam plate, Mechanical chassis or LS gear C.
(✱The following 「LS CAM PLATE ADJUSTMENT」 is not stated on the Service Manual.)

LS CAM PLATE ADJUSTMENT

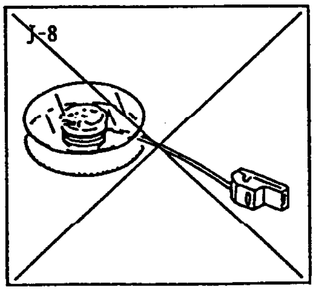
1. Loosely tighten LS cam plate on the back of LS chassis assembly pressing LS cam plate to DRUM with 2 screws (M1.7×1.8) and apply grease to the groove.
2. After installing LS chassis assembly on mechanical chassis.
   ① Loosen two screws (M1.7×1.8).
   ② As pressing LS chassis assembly in the direction arrow Ⓐ.
   ③ Move LS cam plate in the direction of arrow Ⓑ and tighten the screws.

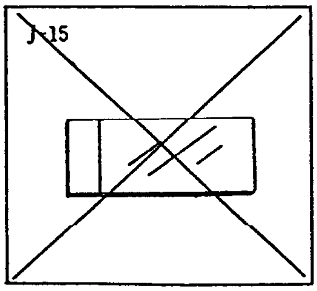


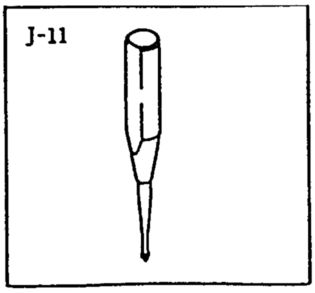
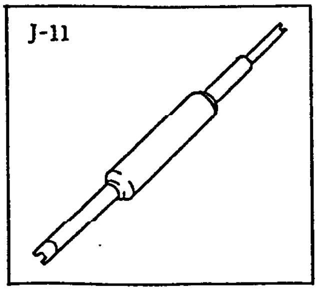


mm Video MECHANICAL ADJUSTMENT MANUAL

☛ : corrected portion

<table>
<tr><th>Page</th><th>Incorrect</th><th>Correct</th></tr>
<tr><td>10</td><td>Note: Oil
Be sure to use the specified oil. (The wrong viscosity may cause problems)
Oil: Part No. 7-661-088-61
(Mitsubishi Diamond Oil Hydrofluid NT-68)</td><td>Note: Oil
Be sure to use the specified oil. (The wrong viscosity may cause problems) ☛
Oil: Part No. 7-661-018-18
(Mitsubishi Diamond Oil Hydrofluid NT-68)</td></tr>
<tr><td>11</td><td colspan="2">Please to delete for J8 and J15.
<table>
<tr><td>J-7</td><td>Tension measurement reel</td><td>J-6080-831-A</td><td></td><td>with ϕ30 tape</td></tr>
<tr><td>~~J-8~~</td><td>~~Tension measurement reel~~</td><td>~~J-6080-832-A~~</td><td></td><td>~~with ϕ16 string~~</td></tr>
<tr><td>J-9</td><td>FWD, RVS winding torque cassette</td><td>J-6080-824-A</td><td>GD-2086</td><td></td></tr>
<tr><td>J-10</td><td>Rotary drum jig</td><td colspan="3">(packed with repair rotary upper drum)</td></tr>
<tr><td>J-11</td><td>Tape path screwdriver</td><td>J-6080-811-A</td><td></td><td>Tape guide adjustment</td></tr>
<tr><td>J-12</td><td>Mode selector II panel</td><td>J-6080-844-A</td><td></td><td></td></tr>
<tr><td>J-13</td><td>Mode selector</td><td>J-6080-825-A</td><td></td><td>For all models</td></tr>
<tr><td>J-14</td><td>Mode selector II conversion connector</td><td>J-6080-845-A</td><td></td><td></td></tr>
<tr><td>~~J-15~~</td><td>~~Tape end detection filter~~</td><td>~~J-6080-848-A~~</td><td></td><td>~~Tape end detection adjust-~~ment</td></tr>
</table>




</td></tr>
<tr><td>11</td><td>
</td><td>
</td></tr>
<tr><td>38</td><td>2) In FWD mode, confirm that T reel torque value is 11g/cm-19g/cm.</td><td>2) In FWD mode, ☛ confirm that T reel torque value is 9.5g/cm-20.5g/cm.</td></tr>
<tr><td>40</td><td>4) Change the position of the tension regulator spring ❸ position ❶ so that the tension is 6.9—7.9g. (Fig. 44, 45)</td><td>4) Change the position of the tention regulator spring ❸ position ❶ so that measure center value of the tention is 6.9—7.9g. (Fig. 44, 45) ☛</td></tr>
</table>

Sony Corporation
Personal Video Group

English
89K0410-1(2)
Printed in Japan

©1987.11

Published by Customer Relations and Service Group